VOLKSWAGEN AG

Vehicle Diagnosis, Testing and Information System VAS 5051B

Operating Manual, Hardware V01.4 03/07

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Associated Documents

Along with this operating manual, which is to be used by the user in the workshop, there are also the following technical documents for the VAS 5051B:

- /1/ Start-up/unpacking instructions VAS 5051B
  with important information on startup and registration of the device.
  This documentation is a component part of the scope of delivery.

- /2/ Brief instructions VAS 5051B
  Foldout sheet with a brief summary of the operation and use of the device. This printed documentation is a part of the scope of delivery.

- /3/ Operating manual VAS 505x Software
  Description of the vehicle diagnosis system with detailed information on the operating modes that can be reached through the start mask. In addition, the operating manual contains the service addresses and forms for the registration of the device and fault reports. Operating manuals can be opened on the tester by the administration. They are located on the base CD.
-
- /4/ VAS 505x service information
  contains important information, addresses and telephone hotllines in case of a fault.

- /5/ Operating Manual VAS 5051
  Refer to the operating manual VAS 5051, Hardware in connection with the VAS 5051 workshop trolley.

- /6/ User Manual, Printer
  The documentation about the printer is included in the delivery scope of the printer. See also the data medium enclosed.

In the running text a reference to the applicable documents appears as follows:

Text....(for further information see /3/).

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Safety Instructions

Meaning of symbols

The safety instructions in the operating manuals, the Startup/Unpacking Instructions or in other documentation provided, on screen displays on the tester during operation and on the products themselves use symbols with the following meanings:

Warning!

Text with this symbol contains information for your safety and how you can reduce the risk of severe or fatal injury.

The **WARNING** symbol warrants particular attention for your safety.

Caution!

Text with this symbol contains information about how you can avoid damage to the vehicle and the tester.

The **Caution** symbol tells you that if the information is ignored, damage to the vehicle and/or the tester could result (e.g.: Ensure that the touch screen is not touched with sharp, edged objects.).

Note

Text with this symbol contains additional, useful information.

A **Note** symbol contains other, special instructions for using the device, and related information.

Note on further safety instructions

The general safety instructions, which are valid for the complete VAS 505x family of testers, are listed in the following. Further safety instructions are to be found in the operating manuals. Therefore, please read the operating manuals before use.

Safety instructions may also appear on the screen of the tester. Follow all the instructions displayed.

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IMPORTANT SAFETY INSTRUCTIONS

1. Warning!

Read all instructions.

2. Warning!

Do not operate equipment with a damaged cord or if the equipment has been damaged - until it has been examined by a qualified serviceman.

3. Warning!

Do not let cord hang over edge of table, bench or counter, or come in contact with hot manifolds or moving fan blades.

4. Warning!

An extension cord is not allowed. For testing use only specified cables.

5. Warning!

Always unplug equipment from electrical outlet when not in use. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.

6. Warning!

To protect against risk of fire, do not operate equipment in the vicinity of open containers of fuel (gasoline).

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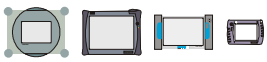

7. Warning!

Adequate ventilation should be provided when working on operating combustion engines.

8. Warning!

Use only as described in this manual. Use only manufactures's recommended attachments.

9. Warning!

Risk of explosions

The devices have internal parts which emit sparks and therefore must not be exposed to flammable fumes. The device should be operated at least 460 mm (18 inches) above the floor surface since fumes from fuels and other materials accumulate at floor level.

10. Warning!

All measurement cables may only be used within the measurement ranges stipulated in the technical specifications and the descriptions in the operating manual. All measurement pick-ups may only be used on cable whose casing is undamaged. Do not carry out measurements on damaged cables.

11. Warning!

The devices connected to electrical power supply correspond to protection class 1 and are fitted with a safety-tested mains cable. They may only be connected to electrical networks with an earthed protective conductor (TN networks) or electrical outlets with earthed protective conductors.

12. Warning!

Fluctuations and deviations in the power supply beyond the permitted range of tolerance can lead to malfunctions and damage.

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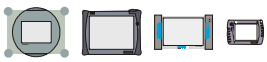

13. Warning!

During test drives, secure the tester with a strap on the vehicle's back seat and connect it to the vehicle using the diagnostic cable. A second person must operate the tester from the back seat. Operation from the front seat is too dangerous, e.g. in the event of airbag activation.

Only for VAS 5051:

To supply the VAS 5051 with power from the vehicle battery, use only the 3 m diagnostic cable.

14. Caution!

Electrical ignition systems carry voltages of up to approx. 30 kV. Observe general safety guidelines for workshops at all times.

15. Caution!

If you open the tester or its accessories without authorisation or carry out improper alterations to them, considerable risk to you and to the device may result.

16. Caution! VAS 5051 - changing fuse

For inline current measurements with the VAS 5051, only a replacement fuse of the same type and same amperage may be installed in order to avoid risks of fire and to protect the device. To order original parts, refer to the corresponding chapters of the operating manual.

17. Caution! VAS 5051B workshop trolley - ventilation

When operating with the VAS 5051B workshop trolley, make sure that there is sufficient ventilation for the table power adapter of the tester and for the printer. Please note that even when the tester is switched off, the battery charging circuit remains in operation and the printer is online (although in energy saving mode).

- Completely open the top cover of the printer or the roll-up door during operation (depending on the existing workshop trolley).
- Heat-dissipation of the table power adapter must not be impaired by objects on top of it (cable, cloth, etc.).
- Pull the mains cable of the workshop trolley to switch off the complete device.

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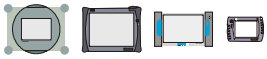


18. Caution! when connecting non-VW vehicles

The VAS 505x diagnostic devices were developed for vehicles from the Volkswagen group. If the tester is connected directly to vehicles from other manufacturers, damage to the vehicle could result.

Therefore if non-VW vehicles are to be tested using the general OBD functions in the Vehicle Self-Diagnosis application, the OBD adapter cable VAS 5052/16 needs to be connected between the diagnostic cable and the diagnostic connection on the vehicle (with fewer cable connections).

19. Caution! when handling the battery

- The battery may only be replaced by trained personnel.
- Never short-circuit the battery.
- Never throw the battery into a fire.
- Dispose of or recycle the battery in accordance to the local regulations.

SAVE THESE INSTRUCTIONS!

Release: 2005-03-30

1 General Information

1.1 General Notes

This operating manual contains the required information for the using the vehicle diagnosis, measuring and information systemVAS 5051B, in further text abbreviated as "VAS 5051B". It is intended for qualified technical personnel who have the appropriate knowledge in the field of vehicle self-diagnosis and test instruments.

Knowledge and technically correct implementation of the safety instructions and warnings contained in this operating manual are the prerequisites for the safe starting-up of the VAS 5051B as well as for safety during operation and maintenance.

Due to space limitations, this operating manual cannot cover all possible details regarding the ↗hardware[1], nor does it cover every conceivable circumstance of start-up, operation, care or maintenance.

Furthermore, the ↗masks displayed here may deviate slightly in content from the masks displayed on the tester.

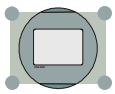
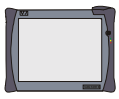
Due to the overlapping validity of much of the information for the VAS 505x tester family, the operating manual has been divided into the following sections:

- Operating Manual, VAS 5051B Hardware (this document) and
- Operating Manual, VAS 505x Software (description of the operating modes of the tester and the applications at the vehicle), /3/.

Tester-specific differences are designated by text and/or symbols. The "VAS 505x" type ID stands for VAS 5051, VAS 5051B, VAS 5052, and VAS 5053.

The pages that are valid for all devices are marked in the header by symbols of the corresponding tester.

Table 1-1 Tester symbols

	VAS 5051		VAS 5052
	VAS 5051B		VAS 5053

1. The glossary arrow ↗ refers the reader to an explanation for the marked term in Chapter 7.

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1.2 Safety Notes

Please observe the safety instructions for the VAS 5051B. They are located on the rear of the device, in the operating manual (hardware and software) following the table of contents and at respective locations where they are relevant. Safety instructions specific to applications are also displayed directly at the tester.

1.3 EC Declaration of Conformity/CE mark

The manufacturer hereby declares (Fig. 1-1) that the device as delivered complies with the following requirements:

- 89/336/EEC Council Directive on the approximation of the laws of the Member States relating to electromagnetic Compatibility (amended by 91/263/EEC, 92/31/EEC, 93/68/EEC and 93/97/EEC)
- 73/23/EEC Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits (amended by 93/68/EEC)

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SIEMENS

EG-Konformitätserklärung
EC Declaration of Conformity

No. 02/04

Hersteller: Siemens AG A&D PT 3
Manufacturer:

Anschrift: Siemensalle 84, D-76187 Karlsruhe
Address:

Produkt-bezeichnung: VAS 5051B 7KE3183-
Product description

Das bezeichnete Produkt stimmt in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
The product described above in the form as delivered is in conformity with the provisions of the following European Directives:

89/336/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit (geändert durch 91/263/EWG, 92/31/EWG, 93/68/EWG und 93/97/EWG).
Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility (amended by 91/263/EEC, 92/31/EEC, 93/68/EEC and 93/97/EEC)

73/23/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (geändert durch 93/68/EWG)
Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits (amended by 93/68/EEC)

CE-Kennzeichnung / *CE marking*: 08

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen:
Conformity to the Directives is assured through the application of the following standards:

Referenznummer *Reference number*	Ausgabedatum *Edition*	Referenznummer *Reference number*	Ausgabedatum *Edition*
EN 61000-6-1	8.2002		
EN 61000-6-4	8.2002		
IEC 61010-1	2001 SE		

Karlsruhe, den / *the* 2004-08-03

Siemens AG

Harald Hüttner, Teilsegmentleiter — Name / *Name*, Funktion / *function* — Unterschrift *signature*

Edgar Geipel, Controller — Name / *Name*, Funktion / *function* — Unterschrift *signature*

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften.
Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail..

H30-S1002-N41 A6593 500.000 6.00 905

Fig. 1-1 EC Declaration of Conformity

1.4 FCC Certification

Warnings because of built-in bluetooth transceiver:

1. Warning!

FCC 15.105: This device was examined and complies with the limit values for digital devices, class A per part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

2. Warning!

FCC 15.19: This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must be able to accept any interference received, including interference that may cause undesired operation.

3. Warning!

FCC 15.21: Changes or modifications made to this equipment not expressly approved by the manufacturer may void the FCC authorization to operate this equipment.

4. Warning!

This equipment complies with FCC radiation exposure limits for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be moved or operate in conjunction with any other antenna or transmitter.

Note

A bluetooth interface application for communication with external devices, e.g. diagnostic radio head, is prepared.

Trade name: Siemens AG
Model No: VAS 5051B

FCC ID: LYHVAS5051B

IC: 267AA-VAS5051B

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions. (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

1.5 Certificate of Calibration

The manufacturer hereby declares (Fig. 1-2) that the device delivered with this operating manual does not require any calibration within the first three years after its delivery.

Regarding calibration after this initial period, see Section 5.6.

SIEMENS

ZERTIFIKAT

Siemens AG

Automation and Drives
Projects Automotive Industry
Diagnostic Systems Shop-Floor

hat das Gerät

VAS 5051B
Bestellnummer: 7KE3183

hergestellt und geliefert.

In den ersten 36 Monaten nach der Auslieferung des Geräts ist keine Kalibrierung erforderlich.

A&D PT 34 S Leitung

Hüttner

Datum: 29.7.04

A&D PT 3 QM

Reichert

Datum: 27.07.04

H30-S1002-N41 A0693 500.000.6.00 905

Fig. 1-2 Certificate of Calibration

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1.6 Designated Use

- The VAS 5051B may only be used at a vehicle.
- The product described has been developed, manufactured and checked according to the relevant safety standards. If the safety instructions are observed, the start-up is carried out as stipulated, the device is used for the intended purpose and the recommended maintenance and care is also observed, then in normal cases there is no danger regarding damages to property or for the health of persons associated with the VAS 5051B.

1.7 Area of Application

Customer service functions, fault recognition and localization in vehicles by means of

- ↗Vehicle Self-Diagnosis
  for performing basic ECU identification.
- ↗Guided Fault Finding
  to localize a fault including identification of the vehicle, generation of a test plan based on the existing symptoms and calling-up a function test for troubleshooting, whereby Vehicle Self-Diagnosis, Test Instruments and documents display can all be used.
- ↗Guided Functions
  for fast call-up of performable customer service functions for a vehicle type, e.g. coding the ECU.
- ↗Test Instruments
  to use the integrated multimeter and the oscilloscope.
- ELSA – Service Information System for VW workshops.
- erWin – Information system for independent workshops.
- Installable applications can also be activated directly from ↗CD-ROM.

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The main features of the VAS 5051B are:

- Update of the tester software via CD or LAN
- Various ↗diagnostics strategies
- A switch-over function for moving between operating modes
- Parallel mode of Vehicle Self-Diagnosis and Test Instruments
- Display of documents for the given context
- Construction that meets the demands of the workshop with a workshop trolley for tester, printer, and suspension equipment for measurement cables and mains distribution
- Battery back-up in case of a power failure or when changing the location of the workplace
- Intuitive operation via ↗Touch screen
- Wireless connection to the diagnostic adapter (prepared)
- Printing functions
- Help functions

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2 Design and Mode of Operation

As an aid to orientation when using the equipment, this chapter describes all components of the VAS 5051B.

The actual operation of the Vehicle Diagnosis, Testing and Information System is explained in the Operating Manual, VAS 505x "Software"/3/.

2.1 Vehicle Diagnosis, Testing and Information System VAS 5051B

You can operate the VAS 5051B as a mobile unit in the workshop. When connected to a vehicle via diagnostic and measurement cables, it provides electronic support for the finding and localizing of faults.

Its main component is the tester. This remains integrated into the workshop trolley during operation in the workshop, although it can also be operated separately, e.g. in a vehicle. Results can be printed using a printer (customized installation of the printer is possible).

At the request of the customer, the VAS 5051B is delivered with a workshop trolley from Fa. Knürr or Fa. Rawotec. Furthermore, it can also be used on a VAS 5051 workshop trolley already owned by the operator. The operator must make the modifications required to the VAS 5051 workshop trolley himself in accordance to the enclosed installation instructions and using the required mechanical components.

The tester is supplied with power either from a table power adapter integrated into the workshop trolley, from the internal battery pack or from the vehicle's battery.

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2.1.1 Scope of Delivery

There are several different types of delivery. These are:

- **Delivery of a complete system** with workshop trolley from Fa. Knürr or Fa. Rawotec
- **Re-equipping** of a VAS 5051 workshop trolley to VAS 5051B (required components) and
- **Accessories that can be ordered** (not contained in the above-mentioned scope of delivery)

Table 2-1 Scope of Delivery VAS 5051B

Components	Delivery of a system	Re-equip-ping of VAS 5051	Acces-sories
Workshop trolley from Fa. Knürr or Fa. Rawotec with cable arm and dust cover	●		
Mains cable 6 m, specific to the country	●		
Fa. Knürr tester mount for re-equipping the VAS 5051 workshop trolley		●	
Power outlet strip from Knürr; EU or USA version	●		
Tester VAS 5051B	●	●	
Table power adapter, 100 - 240 V for supply-ing the tester with power, DC 24 V	●	●	
Mains cable for table power adapter, 3 m, EU or USA version	●		
Battery pack (VAS 5051B/14)	●	●	
USB cable, 1.8 m for printer connection	●	IrDA is used	
Diagnostic cable 5 m (VAS 5051B/1)	●	●	
Diagnostic cable 3 m (VAS 5051B/2)			●
Test adapter cable (VAS 5051B/4) for self-test diagnostic interface	●	●	
Diagnostic adapter (VAS 5051/2) for older vehicles	●		
Diagnostic cable LT2 (VAS 5051B/3) for LT vehicles			●
U/R/D/I measurement cable (VAS 5051B/5)	●	●	

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Table 2-1 Scope of Delivery VAS 5051B

DSO measurement cables (VAS 5051B/6), 2 pieces	●	●	
Current pick-up 100 A (VAS 5051B/7)	●	existing 50 A pick-up	
Current pick-up 1800 A (VAS 5051B/8)		existing 500 A pick-up	●
kV pick-up (VAS 5051/17)	●		
Trigger clamp (VAS 5051/18)	●		
Temperature sensor			●
Pressure sensors			●
One set of touch pens (3 pieces, VAS 5051/11)	●	●	
Test probe tips, 5 pieces, for U/R/D/I and DSO cable (only for red/black test probes)	●	●	
USB keyboard (VAS 5051B/23, specific to the countrys refer to Section 4.5.3)	●	●	
USB wheel mouse (VAS 5051B/24)	●	●	
OKI printer including documentation - EU version 230 V (220 - 240 V) - USA version 120 V (110 -127 V) - Japanese version 100 V	●		
OBD adapter cable (VAS 5052/16) for vehicles from another source.			●
Start-up instructions, specific to the language	●	●	
Brief instructions, specific to the language	●	●	
Operating Manual, VAS 5051B "Hardware", specific to the language, on the base CD	●	●	
Operating Manual, VAS 505x "Software", specific to the language, on the base CD	●	●	

There is an overview of the compatibility of the diagnostic and measurement cables within the VAS 505x family of testers contained in Section 2.5.13.

For additional accessories that can be purchased, please refer to Section 2.9.

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2.1.2 VAS 5051B diagnostic system

The VAS 5051B diagnostic system is comprised of the following components:

- Tester (Section 2.2) with table power adapter (Section 2.3)
- Workshop trolley (Section 2.4)
- Diagnostic and measurement cables (Section 2.5)
- Keyboard and mouse (Section 2.6)
- Printer (Section 2.7)
- Accessories (Section 2.8 and Section 2.9)

Fig. 2-1 VAS 5051B, to the left is the model with workshop trolley from Fa. Knürr, and to the right with workshop trolley from Fa. Rawotec

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2.2 Tester VAS 5051B

The tester provides several different ↗ operating modes to choose from, such as Vehicle Self-Diagnosis, Test Instruments, Guided Fault Finding and Guided Functions. It can therefore be used equally well as a fault reader, a measuring instrument and an intelligent fault identification system.

The operating system and the applications are stored in the tester.

The tester reacts to entries that are made by touching the ↗ touch screen directly using a finger or the touch pen integrated into the device. Alternatively, the tester can also be operated using the enclosed USB mouse.

The printer of the workshop trolley is operated via the USB interface. When re-equipping a VAS 5051 workshop trolley, the already existing IrDA interface is used. The user's own printer (USB or LAN) can also be installed in the system. The printer is setup in the Administration.

 All rights reserved.

2.2.1 Power Supply

The tester can be operated with an AC current between 100 and 240 V via the table power adapter integrated into the workshop trolley or from the vehicle's on-board electrical system via the diagnostic cable. The built-in battery pack supplies the device with power for up to 60 minutes continuously (depending on the operating mode). This ensures that the tester does not have to be switched off when changing location.

Note

It is possible to operate the tester with power from the on-board network using the diagnostic cable (without connecting the table power adapter) only when the vehicle battery is sufficiently charged. Its power consumption is limited to approx. 45 watt. The remainder of the required energy is taken from the battery pack of the tester. When operated in this way, the tester should therefore not be operated with an empty battery pack.

Caution! Printer Connection

The voltage range of the printer is different from that of the tester and limited to a particular rated voltage. Make sure when connecting the printer that it is supplied with the correct voltage.

 All rights reserved.

2.2.2 Front Panel

The following components are located on the front panel:

1. On/Off button
2. ↗LED array
3. Touch screen

Fig. 2-2 Front Panel of the Tester

 All rights reserved.

2.2.2.1 On/Off button

- To switch on the tester, press the On/Off button approx. 1 s, until the LED test starts to flash (see Section 2.2.2.2).
- To switch off the tester, press the On/Off button for approx. 1 s, until a max. of 5 s. After 5 s, the tester is immediately turned off. You should only do this when the tester cannot be turned off properly according to the instructions listed above.

Caution!

If the tester is switched off immediately using the On/Off button (pressed for longer than 5 s), then data may be lost and the operating system may be damaged!

Note

The tester switches on automatically when a connection has been established to the vehicles' on-board electrical system via the diagnostic cable and when there is enough charge in the battery for the tester.

2.2.2.2 LED array

The three LEDs underneath the On/Off button display the operating conditions of the tester.

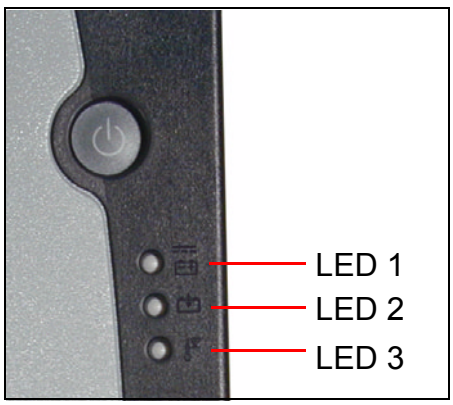

Fig. 2-3 LED array

After switching on the tester, an LED test is initiated. During this test, LED 1 lights up orange and then green, LED 2 lights up yellow and LED 3 lights up red (consecutively). The current operating conditions are then displayed.

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Table 2-2 Meaning of the LEDs

LED 1, two-coloured	It lights up when the tester is switched on: • **Green** if the power supply is from the mains or from the vehicle's on-board electrical system (if both the mains and the vehicle's on-board electrical system are connected then the device is supplied from the mains). • **Orange** if the power supply is from the battery pack. • **Orange (blinking)** with internal power supply from the battery, and when the charge is low. A standard Windows system report appears before LED 1 starts to flash orange (just as it does with laptops/notebooks): ***"Low Battery*** ***You should change your battery or switch to outlet power immediately to keep from losing your work."*** Now proceed as follows: 1. Acknowledge the message. 2. Connect the workshop trolley to the mains and establish the power connection for the tester via the DC connection (the battery is now charged). It is not sufficient to connect to the vehicle's on-board electrical system via the diagnostic cable as the power consumption from the vehicle battery is limited to a max. of 5 A. The local battery will continue to be drained. • **Green/orange (blinking in alternation)** with external power supply from the mains or the on-board power supply when the battery is removed or is defective. • **Yellow** when power is supplied from the vehicle's on-board electrical system of the vehicle and from the battery (the current from the vehicle's battery is limited to a max. of 5 A and is currently insufficient). • **Yellow/green (blinking briefly)** Supplied from the vehicle's on-board power supply and from the battery, whereby the battery is almost completely discharged (empty). Connect the workshop trolley to the mains and establish the power connection for the tester via the DC connection.
LED 2, single colour	This lights up • **Yellow** when charging the battery and goes off after it is fully charged (approx. 2.5 h). • **Yellow (briefly flashing)** when battery is almost completely drained. Charge with low current to reactivate it. LED 1 flashes green and orange alternately. If the battery does not function again after two hours, stop charging. Replace the battery.

 All rights reserved.

Table 2-2 Meaning of the LEDs

LED 3, single colour	This flashes **red** if the tester is too hot. If LED 3 begins to flash then the tester switches itself off automatically after approx. 10 s. The LED keeps flashing. The fan is kept on to cool down the tester. If the overtemperature remains after the device has switched off then the tester prevents itself from being switched back on until it has sufficiently cooled down. When using the battery, the cooling-down process is limited to a maximum of 5 minutes and then the tester is turned off completely. If the tester is switched back on while it is cooling down then the cooling-off process is repeated again for a maximum of 5 minutes.

2.2.2.3 Touch Screen

The touch screen is the user interface. Masks with selection boxes and buttons appear on this screen, and these should preferably be selected/pressed using the touch pen.

Energy saving mode

If the tester is not operated for several minutes then energy saving mode is switched on. There are two energy saving modes depending on the power supply to the tester:

1. If the tester is supplied with power via the table power adapter or via the diagnostic cable then the screen switches off after 15 minutes if it is not operated or if the programme that is currently running does not generate any continuous display on the screen. As soon as you touch the screen near its upper edge, the last mask displayed will be shown again. You should not touch other areas of the screen, since that could trigger unintended programme functions. An exception to this is the Vehicle Self-Diagnosis operating mode which is ended with the blanking of the screen. The start mask is then displayed after switching back on.
2. The screen blanks after 5 minutes when using the battery. Otherwise there are no differences here.

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2.2.3 Left side

On the left side there are:

1. two fans
2. a protective cover for the DVD drive
3. the DVD drive

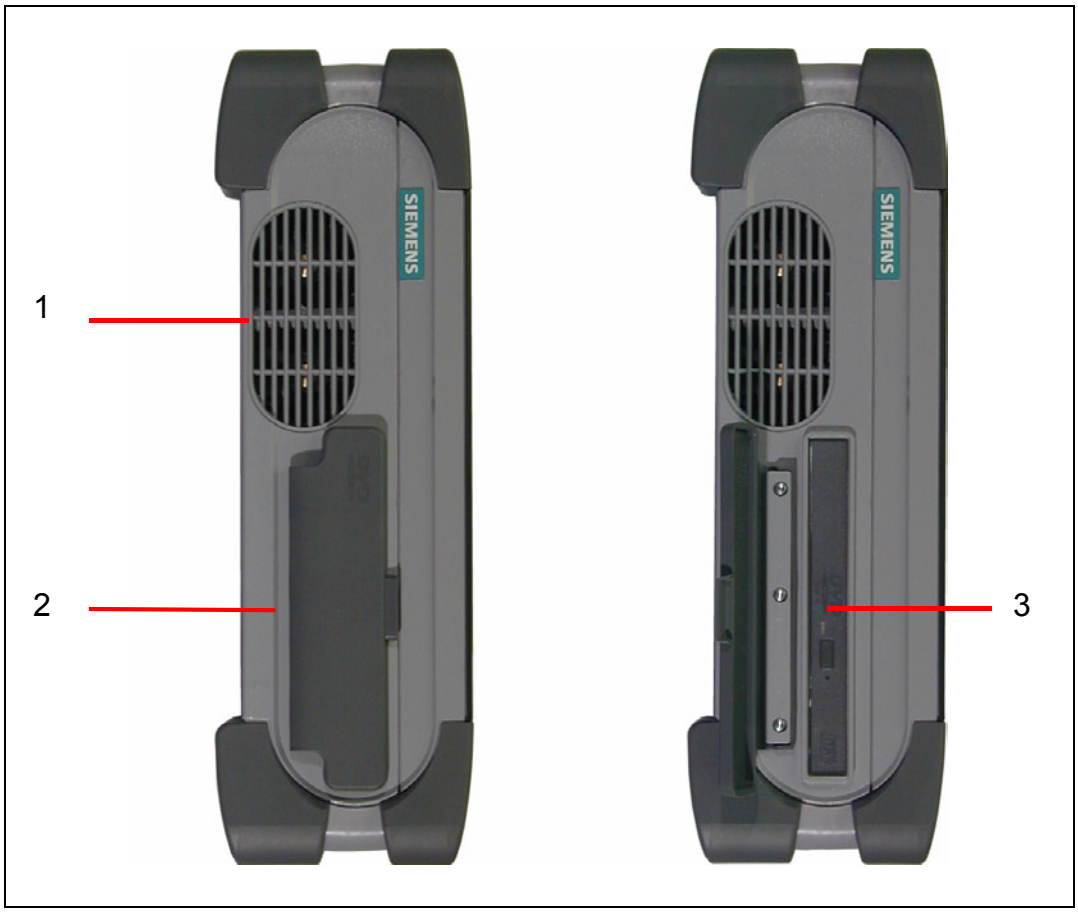

Fig. 2-4 Left side of the tester

Note

When you open the DVD drawer, sensitive components of the lens system are now accessible. Make sure that these do not become dirty or damaged.

When you insert a CD or DVD, make sure that it correctly engages in the DVD drawer in the center, re. in the bracket.

When operating the DVD drive, the tester must not be inclined by more than 15° (from the vertical or horizontal position).

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2.2.4 Right side

On the right side there are:

1. Touch pen
2. Chip card reader
3. LAN interface for network operation
4. Two double-layered USB interfaces for connecting a USB printer, a keyboard (enabled for ELSA application), a mouse and an external storage device (see Section 2.9)
5. IrDA interface for connecting a printer with an infrared interface, e.g. in a re-equipped VAS 5051 workshop trolley
6. RS232 interface for servicing
7. DC input, connection for table power adapter
8. Audio input/output for connection of a headset (headphones)

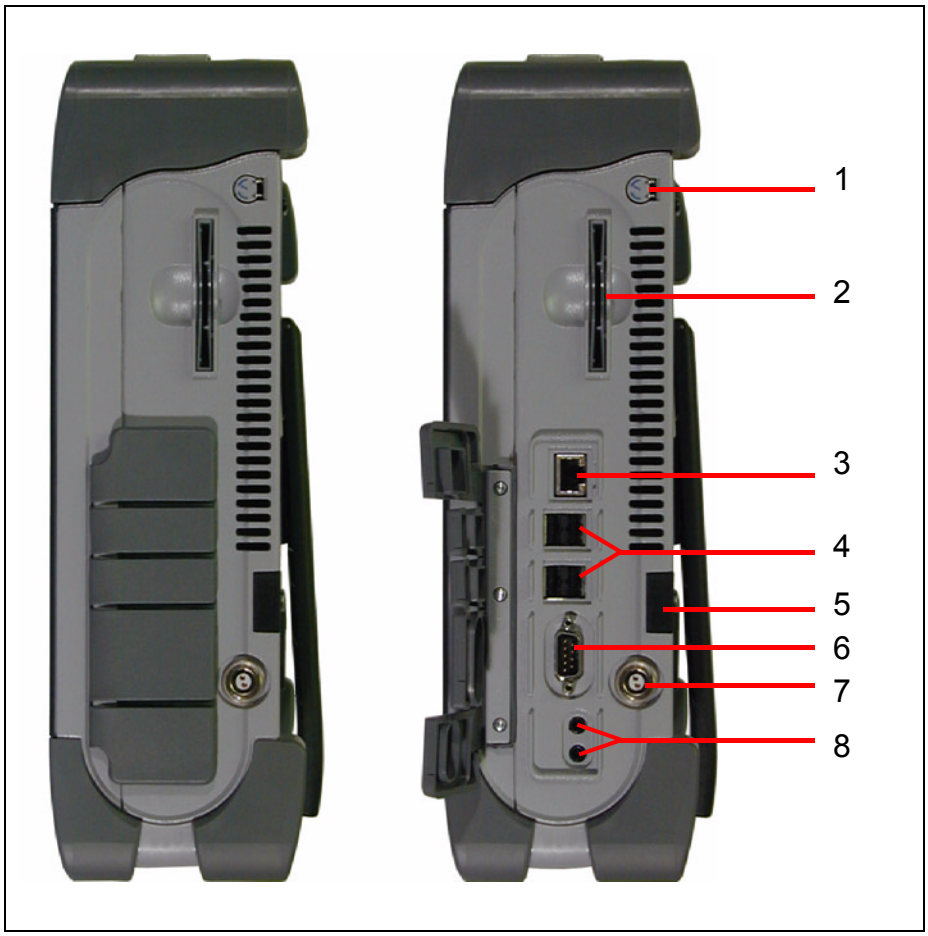

Fig. 2-5 Right side of the tester

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2.2.5 Top

The connections for the diagnostic cable and the measurement cable, as well as the handle, are located on the top of the tester.

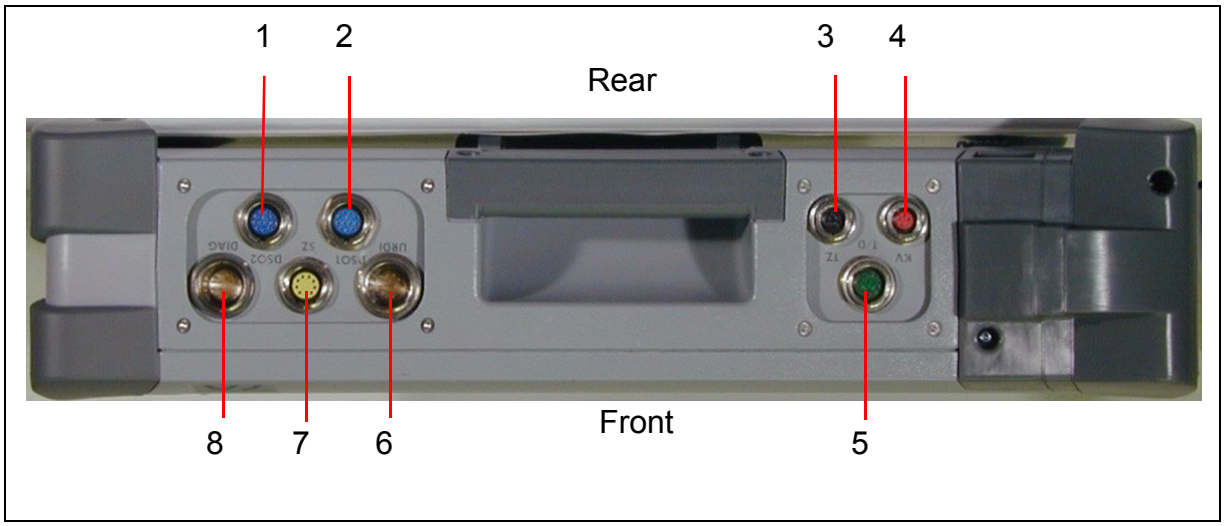

Fig. 2-6 Top of the Tester

Table 2-3 Connection sockets on the top of the tester

No.	Labelling	Connection sockets for
1.	**DSO2**	DSO measurement cable 2
2.	**DSO1**	DSO measurement cable 1
3.	**TZ**	Trigger clamp
4.	**KV**	kV pick-up
5.	**T/D**	For temperature or pressure sensor
6.	**U/R/D/I**	U/R/D/I measurement cable for measuring the voltage, current and resistance, and for diodes and continuity test
7.	**SZ**	Current pick-up 100 A, or 1800 A; the 50 A and 500 A current pick-ups from the VAS 5051 can also be used.
8.	**DIAG**	Diagnostic cable

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2.2.6 Rear

On the rear of the tester are:

1. VGA interface
2. IrDA interface for connecting a printer with an infrared interface, e.g. in a re-equipped VAS 5051 workshop trolley (can also be seen in Fig. 2-5)
3. Touch pen ejector
4. Two PCMCIA interfaces (underneath screw-on corner piece)
5. Window to permit viewing of control LEDs on PCMCIA cards
6. Handle
7. Bluetooth interface (underneath screw-on corner pieces)
8. Name plate with system ID and warning instructions in English. The system number contains the production number (F-Nr.) as its last five digits. This is also identical to the equipment number as displayed in the Administration.
9. Support leg for table operation (can be hinged out and snapped in)
10. Cover of battery compartment

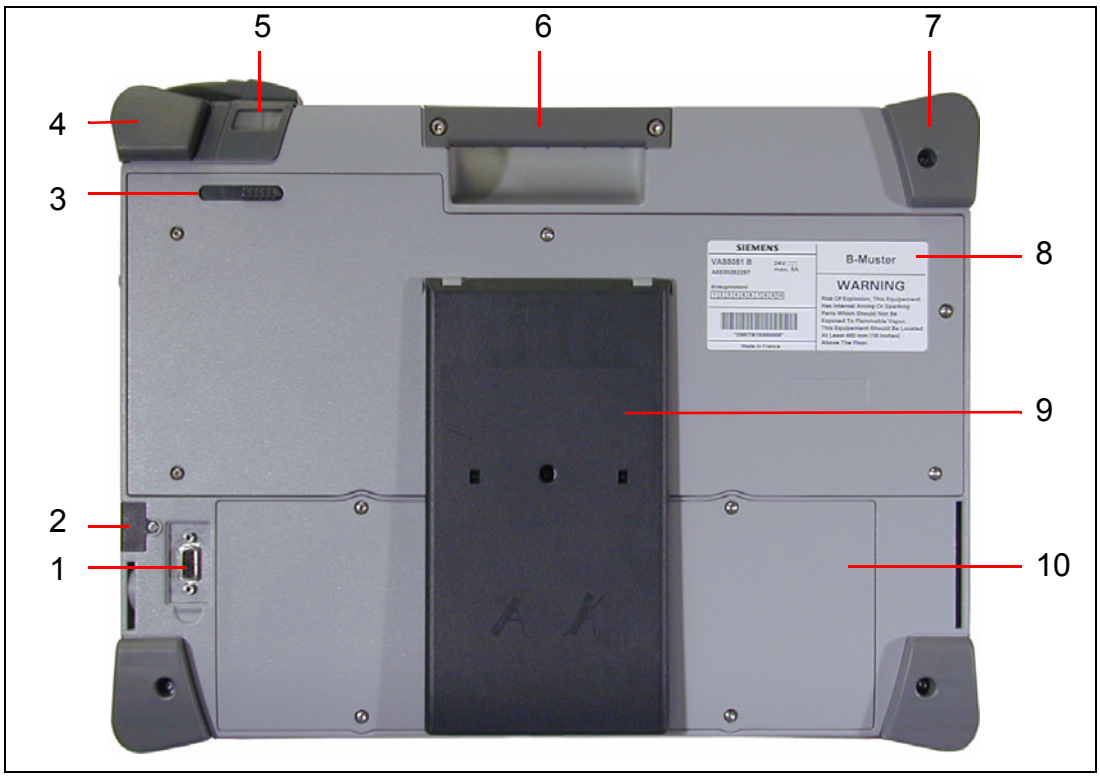

Fig. 2-7 Rear of the Tester

 All rights reserved.

2.2.7 Bluetooth interface

The device has been prepared for use with bluetooth. The bluetooth antenna is underneath the corner piece on the top left (Fig. 2-7, 7). The bluetooth function will be enabled at a later time.

2.3 Table power adapter

The table power adapter is incorporated into the workshop trolley and is connected there at the mains end via a mains cable with non-heating device plug to the power outlet strip.

It is connected to the DC input on the right side of the tester via an angled two-pin connector (Fig. 2-5, 7).

Fig. 2-8 Table power adapter without mains cable

 All rights reserved.

2.4 Workshop Trolley

The workshop trolley is a mobile frame that has holding fixtures for the tester, the diagnostic and measurement cables and a printer. It has its own mains connection as well as mains distribution via a power outlet strip.

The VAS 5051B can be moved within the workshop using the workshop trolley. You can also place accessories on it.

The 6 m mains cable is delivered specific to the country it is to be used in (see Parts List for the VAS 5051B).

At the request of the customer, the VAS 5051B is delivered with a workshop trolley from Fa. Knürr or Fa. Rawotec. When required, the VAS 5051 workshop trolley can also be re-equipped to hold the VAS 5051B tester.

Caution!

When operating with the workshop trolley, make sure that there is sufficient ventilation of the table power adapter for the tester and for the printer. Please note that even when the tester is switched off, the battery charging circuit remains in operation and the printer is online (although in energy saving mode).

- Completely open the top cover of the printer or the roll-up door during operation.
- Heat-dissipation of the table power adapter must not be impaired by objects on top of it (cable, cloth, etc.).
- Pull the mains cable from the workshop trolley to switch off the complete device.

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Fig. 2-9 Workshop trolley, Fa. Knürr model

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Fig. 2-10 Workshop trolley, Fa. Rawotec model

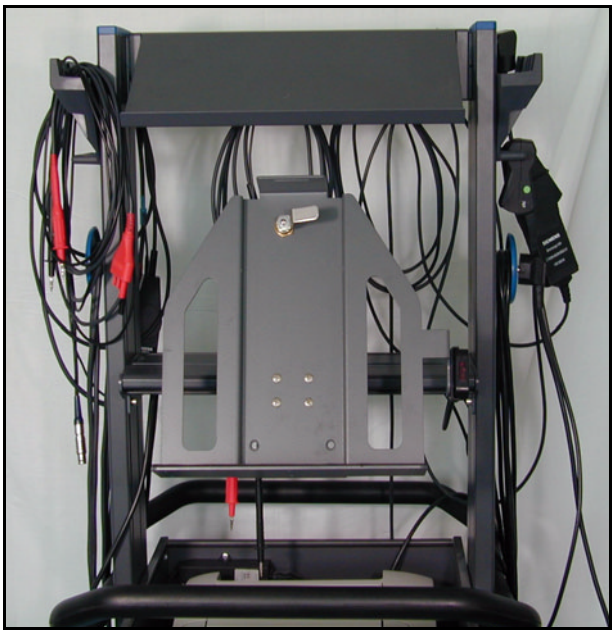

Fig. 2-11 Re-equipped workshop trolley VAS 5051, tester mounting

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2.5 Diagnostic and measurement cables

The diagnostic and measurement cables form the measurement interface between the VAS 5051B and the vehicle. They detect the measured signals from the test object and pass them on to the VAS 5051B for further processing.

All diagnostic and measurement cables are described in the following. Which cable is delivered with which package can be seen in Table 2-1.

2.5.1 Diagnostic cables 5 m (VAS 5051B/1), 3 m (VAS 5051B/2)

The same diagnostic cables are available in a 5 m model and also in an optional 3 m model. They make the connection between the tester and the on-board power supply and permit the battery voltage T30, the condition recognition of the ignition T15 (if available) and ECU identification to be monitored.

Fig. 2-12 Diagnostic cable

When connected to a vehicle, both diagnostic cables also supply the tester with power from the vehicle's on-board electrical system. The tester will switch itself on automatically as soon as it is connected to this supply. The diagnostic cables are designed for use on J1850, CAN and ISO 9141 interfaces and consist of an 18-pin round plug, the cable and a 16-pin diagnostic plug (black) for connecting to the vehicle, conforming to SAE J1962.

Note

Only VAS 5051B/1 and VAS 5051B/2 diagnostic cables may be used. Diagnostic cables from other testers cannot be operated at the VAS 5051B.

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2.5.2 Diagnostic adapter (VAS 5051/2)

The diagnostic adapter makes it possible to connect older vehicles with 2x2-pin diagnostic sockets to the diagnostic cable. The diagnostic adapter consists of two 2-pin diagnostic flat connectors, two cables and the 16-pin diagnostic coupling with socket contacts.

The supply of power to the tester from the vehicle's on-board electrical system via the diagnostic cable is also facilitated by the diagnostic adapter.

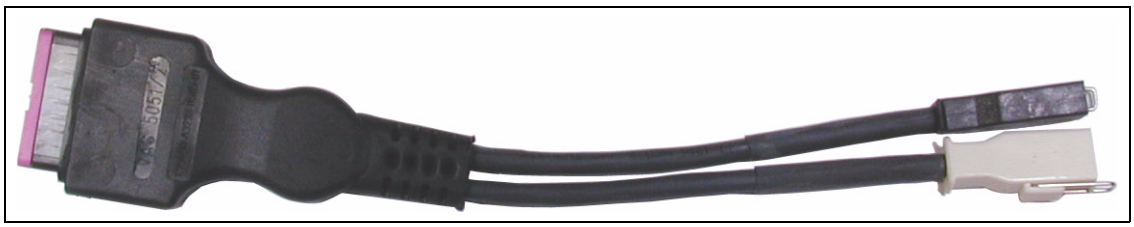

Fig. 2-13 Diagnostic adapter

Note

You can use the diagnostic adapter at all VAS 505x testers.

2.5.3 OBD adapter cable (VAS 5052/16) for non-VW vehicles

To use the generally applicable OBD functions at ↗non-VW vehicles, the following adapter must be connected between the diagnostic cable and the diagnostic socket of the vehicle.

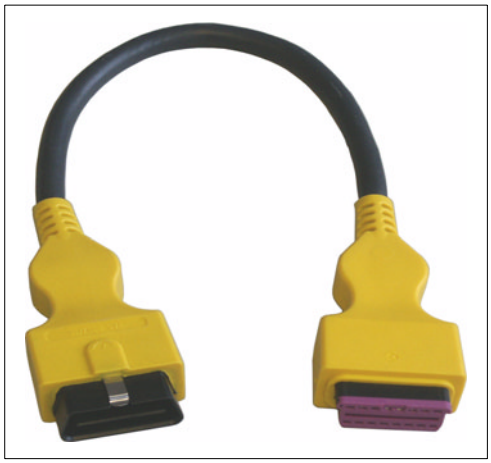

Fig. 2-14 OBD adapter cable for non-VW vehicles

Caution!

The VAS 505x diagnostic devices were developed for vehicles from the Volkswagen group. If the tester is connected directly to vehicles from other manufacturers, damage to the vehicle could result.

Therefore if vehicles of other makes are to be tested using the general OBD functions in the self-diagnosis application, the OBD adapter cable VAS 5052/16 needs to be connected between the diagnostic cable and the diagnostic connection on the vehicle (with fewer cable connections).

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2.5.4 Diagnostic cable LT2 (VAS 5051B/3)

The 3 m long, optional diagnostic cable LT2 comprises an 18-pin plug (identification: black), the cable itself and a 14-pin diagnostic plug at the vehicle.

Fig. 2-15 Diagnostic cable LT2

The diagnostic cable LT2 enables function-oriented addressing of Daimler-Benz vehicle systems (small commercial vehicles). This cable can also be used to monitor battery voltage. In addition, terminal 15 is connected up so that the status "Ignition on" can be automatically detected.

An LED array at the diagnostic cable LT2 displays the selected channel. The engine speed can be read via the red contact plug at the cable housing.

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2.5.5 Test adapter cable (VAS 5051B/4)

The test adapter cable is used during the self-test of the diagnostic interface. In preparation for this, the adapter cable is connected between the diagnostic cable and the diagnostic socket of the vehicle. Several leads are looped-back in the adapter cable for test purposes. The cable gets its required power supply from the vehicles' on-board electrical system. The vehicle ignition must not be activated in order to be able to carry out the self-test. Any type of vehicle can be used.

Fig. 2-16 Test adapter cable

 All rights reserved.

2.5.6 U/R/D/I measurement cable (VAS 5051B/5)

The 3 m long active U/R/D/I measurement cable consists of a 12-pole pin plug (identification: purple), the cable with a housing and integrated signal processing, and the red/black and black probe tips.

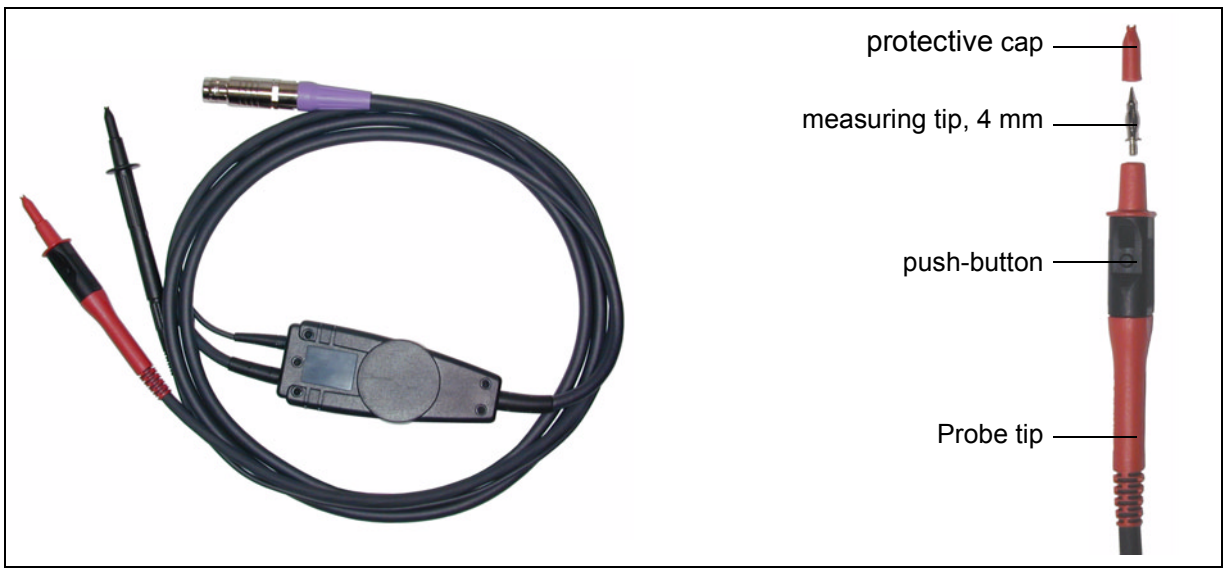

Fig. 2-17 U/R/D/I measurement cable (with protective caps on the probe tips)

The U/R/D/I measurement cable is used for measuring voltages, resistances, ↗ inline currents as well as for the diodes and continuity tests.

Caution! when using the U/R/D/I cable.

The U/R/D/I cable (with purple identification of the pin plug) is approved only for voltage peaks up to 42 V and current measurements up to 2 A.
Change the cable to measure higher voltages/currents!

The button on the red/black probe tip has application-specific functions such as switching on the freeze frame function, triggering a measurement, etc. For additional information, please refer to /3/, Test Instruments, Guided Fault Finding.

The measuring tip in the red/black probe tip can be unscrewed and can be obtained as a spare part (see Parts List for the VAS 5051B).

The black probe tip can be pulled off of the cable together with the handle.

Note

You cannot use the U/R/D/I measurement cable at the VAS 5051.

2.5.7 DSO measurement cables (VAS 5051B/6)

The two identically constructed active DSO measuring cables DSO1 and DSO2 consist of a 12-pole pin plug (blue identification), the cable with a housing and integrated signal processing as well as red/black and black probe tips.

To distinguish the leads, a blue clamp marked "DSO1" or "DSO2" is attached on the cable in the direction of the red/black probe tip.

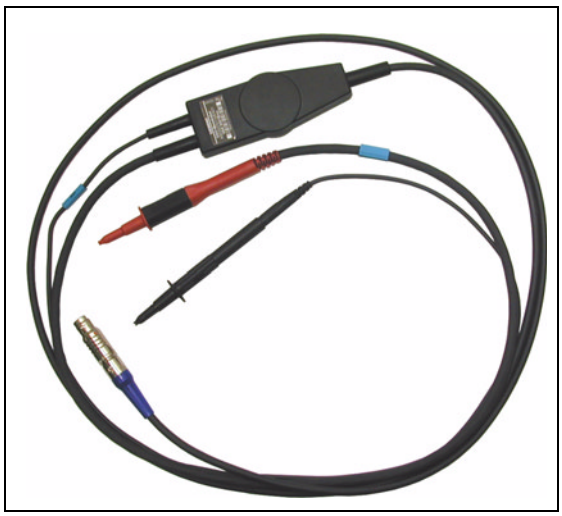

Fig. 2-18 DSO measurement cable (with protective caps on the probe tips)

The two identical DSO1 and DSO2 measurement cables are used together with the two-channel digital storage oscilloscope. Both measurement connections must always be adapted for each measurement cable used when measuring. The button in the red/black probe tip has application-specific function such as switching on the freeze frame function, triggering a measurement, etc. For additional information, please refer to /3/, Test Instruments, Guided Fault Finding.

The measuring tip in the red/black probe tip can be unscrewed and is available as a spare part (see part list VAS 5051B).

The black probe tip can be pulled off of the cable together with the handle.

Caution! when using the DSO cables.

DSO cables (with blue identification of the pin plug) are approved for voltage peaks up to 400 V and not designed for use in the measurement categories II, III and IV.

For this reason, use the DSO cables only for measurements on the vehicle. Keep possible overvoltages in mind when measuring.

Measurements on the mains voltage are not permitted!

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2.5.8 100 A (VAS 5051B/7) and 1800 A (VAS 5051B/8) current pick-up

The 100 A and 1800 A current pick-ups (optional) consist of an 8-pin connector (with yellow marking), the cable and the actual current pick-up.

Fig. 2-19 100 A current pick-up

Fig. 2-20 1800 A current pick-up

The current pick-up can be opened and can then be laid around the cable whose current is to be measured. Cables can be adapted up to a diameter of 26 mm (100 A current pick-up) or 32 mm (1800 A current pick-up).

The level of measurement accuracy depends to a large degree on being able to close the two halves of the pick-up completely without there being any gap. To avoid measurement errors due, for example, to dirt within the root area, both pick-ups have a locking control mechanism. The software thereby receives a signal that the two halves of the pick-up are closed and that a measurement can now be made.

Furthermore, the 100 A pick-up is also equipped with a control LED in the grip (see Fig. 2-19). If the pick-up is not correctly connected then the LED lights up. At the same time, the following message appears in the information window to the right on the tester: ***Current pick-up not closed!***

The measurement result depends on direction.

Note

The 50 A (VAS 5051/9) and 500 A (VAS 5051/19) current pick-ups from the VAS 5051 can also be used at the VAS 5051B.

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2.5.9 Trigger clamp (VAS 5051/18)

The trigger clamp (identical to the trigger clamp from VAS 5051) consists of a 5-pin connector (with black marking), the cable and the actual trigger clamp.

Fig. 2-21 Trigger clamp

The trigger clamp can be opened and can then be laid around the ignition cable to be used in triggering. Ignition cables up to 11 mm in diameter can be adapted. The trigger clamp measures the starting pulse of which the course of the signal is to be displayed on the oscilloscope. Clamp the trigger clamp to ignition cable 1, for example, if you want to display a signal from the time of ignition of the first cylinder.

Note

The trigger clamp is laid around the insulated ignition cable and has no direct contact to the ignition voltage.

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2.5.10 kV pick-up (VAS 5051/17)

The kV pick-up (identical to the kV pick-up from VAS 5051) consists of a 5-pin connector (with red marking), the cable and the sensor.

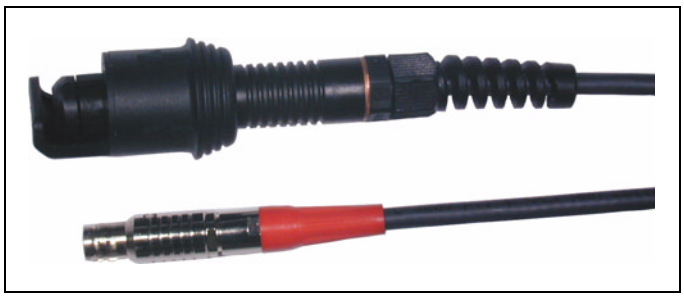

Fig. 2-22 kV pick-up

The kV pick-up is used to detect the ignition voltage amplitude and the course of the ignition voltage in the ignition system. It can be opened and can then be clamped onto one of the vehicle's ignition cables. It functions here as a capacitive voltage divider. Ignition cables from 5 mm to 9 mm in diameter can be adapted.

Note

The kV pick-up is clamped to the insulated ignition cable and does not have direct contact to the ignition voltage.

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2.5.11 Temperature sensor

The temperature sensor consists of a 10-pole pin plug (marked in green), the cable and the sensor, which is made up of a hand grip and a 1 m long flexible protective tube made of Teflon with an adjustable conical rubber seal.A PT100 element is located on the tip of the dipstick. The rubber seal performs two important functions:

- Determining the dipstick immersion depth
- Hermetically sealing the measurement point

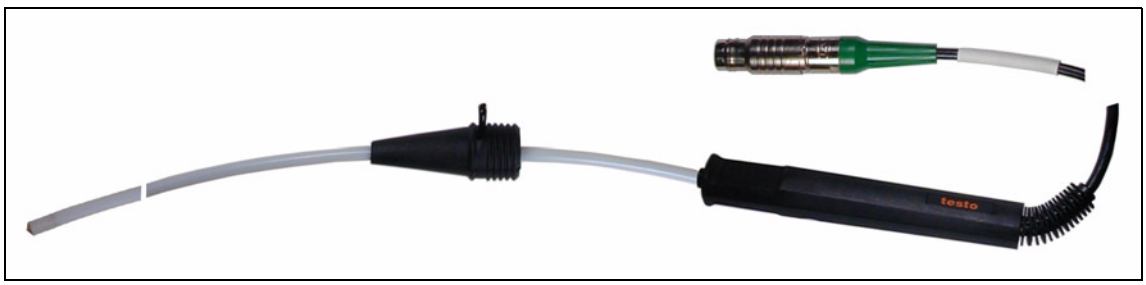

Fig. 2-23 Temperatur sensor (example)

Determining the immersion depth of the dipstick

The rubber sealing on the dipstick is set according to the instructions from the respective function test (see /3/). This thereby limits the immersion depth of the dipstick, e.g. in the oil sump. The immersion depth can differ depending on the vehicle.

Caution!

If the immersion depth is not set correctly using the rubber sealing, then the temperature sensor may be destroyed and the engine may be damaged.

Air-tight closing of the measurement point

The conical design of the rubber sealing allows the measurement point to be closed in an air-tight manner.

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2.5.12 Pressure sensors

At the "T/D" (Fig. 2-6, 5) measurement input, you can optionally connect one of four sensors to detect the relative pressure (with respect to the normal air pressure) of various media (gas, liquids). A pressure sensor is first adapted to the pressure sensor cable and then to the VAS 5051B. At the vehicle, you connect the sensor to the measurement point via a special adapter (special tool).

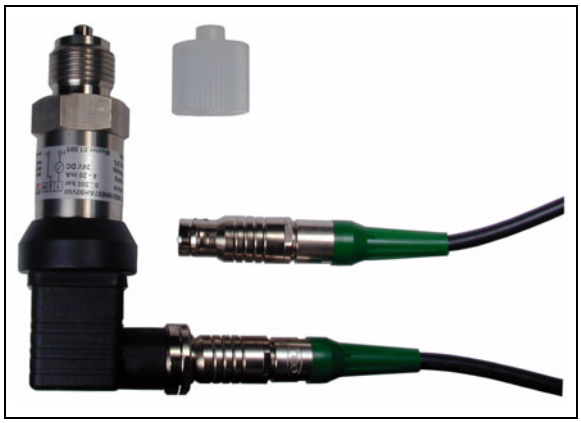

Fig. 2-24 Pressure sensor (example)

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2.5.13 Comparison of compatibility of VAS 505x diagnostic and measurement cables

Table 2-4 Special cables for the VAS 5051B

	Cable	5051B	5051	5052	5053
VAS 5051B/1	5 m diagnostic cable	●			
VAS 5051B/2	3 m diagnostic cable (optional)	●			
VAS 5051B/3	Diagnostic cable LT2 (optional)	●	●		
VAS 5051B/4	Test adapter cable for self-test	●			●
VAS 5051B/5	U/R/D/I measurement cable	●			
VAS 5051B/6	DSO measurement cable	●	●		
VAS 5051B/7	100 A current pick-up	●	●[1]		
VAS 5051B/8	1800 A current pick-up	●	●[1]		

1. from base CD V08.00

Table 2-5 Special cables for the VAS 5051

	Cable / Sensor	5051B	5051	5052	5053
VAS 5051/2	Diagnostic adapter for older vehicles	●	●	●	●
VAS 5051/4	Diagnostic cable LT2	●	●	●	●
VAS 5051/5A	5 m diagnostic cable		●		
VAS 5051/6A	3 m diagnostic cable		●		
VAS 5051/7	U/R/D measuring lead		●		
VAS 5051/8	DSO measurement cable		●		
VAS 5051/9	50 A current pick-up	●	●		
VAS 5051/17	kV pick-up	●	●		
VAS 5051/18	Trigger clamp	●	●		
VAS 5051/19	500 A current pick-up	●	●		
	Temperature sensor	●	●		
	Pressure sensors	●	●		

Table 2-6 Special cables for the VAS 5052

	Cable / Sensor	5051B	5051	5052	5053
VAS 5052/3	5 m diagnostic cable			●	
VAS 5052/4	Test adapter for self-test			●	
VAS 5052/16	OBD adapter cable	●	●	●	●

Table 2-7 Special cables for the VAS 5053

	Cable / Sensor	5051B	5051	5052	5053
VAS 5053/3	3 m diagnostic cable				●
VAS 5053/12	Diagnostic cable LT 2			●	●

2.6 USB keyboard and USB mouse

All operations at the tester can also be carried out using the USB mouse. To do this, connect the mouse to a USB interface of the tester. The pointer on the screen then follows the movements of the mouse. A selection in the masks can be made using the left mouse button.

For keyboard entries on the tester you can use the USB keyboard as well as the displayed virtual keyboard (see /3/), but only in the keyboard layout of a language that can be set on the tester.

2.7 Printer

The VAS 5051B is delivered with an OKI B4350 printer (OKI Microline 22L for Japan) as standard. Printers from the VAS 5051 can also still be used. Furthermore, you can also install additional USB and network printers.

The printer is used for printing out screen masks, measurement results, etc. It is loaded with DIN A4 paper for the European version, and for the USA version with US letter paper.

The printer is delivered with:

- Mains cable
- Toner cartridge (packaged separately)
- Software installation instructions
- Operating instructions

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- A CD-ROM with drivers and the operating manual as a PDF file

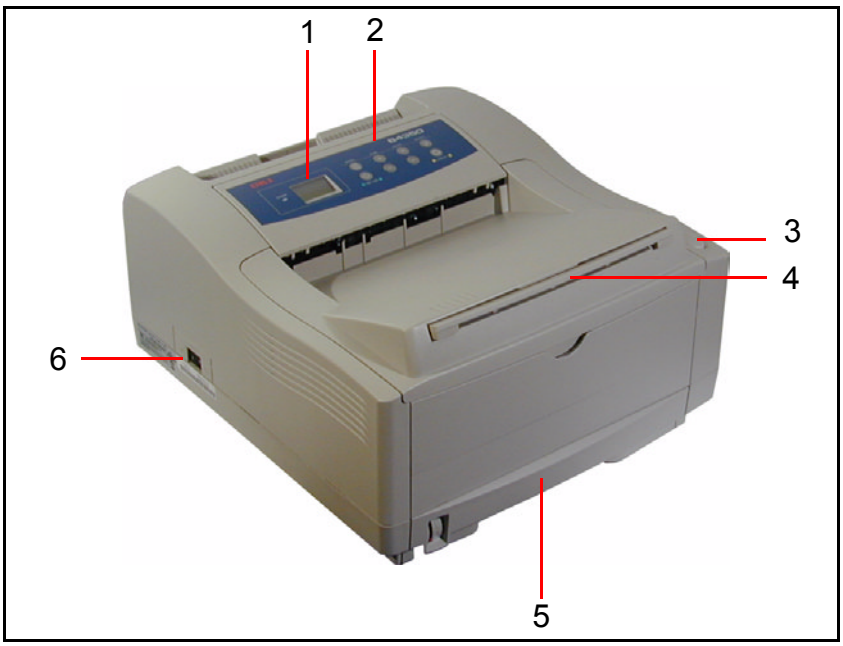

Fig. 2-25 Printer

1. Display
2. Key panel
3. Release button
4. Extension for the form feedout
5. Paper tray
6. On/Off switch

At the workshop trolleys from Fa. Knürr and Fa. Rawotec the printer is operated via the USB interface. In case of a re-equipped workshop trolley VAS 5051, the previously used IrDA interface continues to be used (refer also to /5/).

All information regarding start-up, operation, maintenance and troubleshooting of the printer is contained in the enclosed documentation. The manual /6/ is on the driver CD.

You can call up the printer manual as follows:

1. Insert the CD labelled ***CD 2, Printer User Guide*** into the CD drive of a PC on which Acrobat Reader has been installed.
2. The following mask now appears:

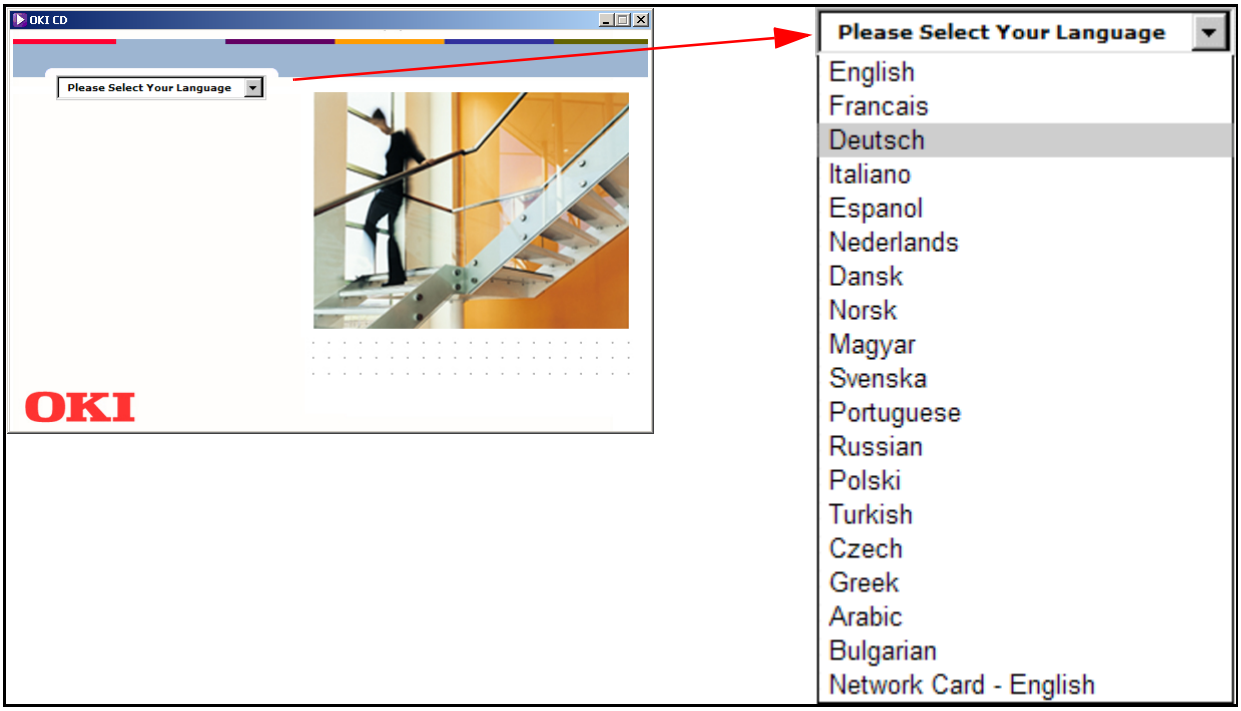

Fig. 2-26 Dialog box for language selection of the printer manual

If the window does not open automatically then start the file ***setup.exe*** manually from the main directory of the CD-ROM.

3. Use the pull-down menu to move to "Please Select Your Language" and then select your language.
4. The manual is now displayed.

Note

If the manual is not available on the CD in your language then please contact OKI directly, for example, at their website www.oki.com.

2.8 Optional accessories

The following optional accessories can be obtained in addition to the normal scope of delivery of the system (Section 2.1.1):

- Diagnostic cable 3 m (VAS 5051B/2)
- Diagnostic cable LT2 (VAS 5051B/3)
- 1800 A current pick-up (VAS 5051B/8)
- OBD adapter cable (VAS 5052/16) for connecting vehicles from another source
- Temperature sensor
- Pressure sensors

2.9 Accessories that can be bought on the open market

The following commercially available components can be used:

- Earphone with headset
- USB printer (other printers can also be installed by the user – see /3/)
- External storage device:
  - USB memory – all models released by VW can be connected to the tester.
    Alternative:
  - A USB floppy disk drive (compatible models: Teac FD-05PUB, FD-05PUW) – You can only use these USB floppy disk drives safely as the required software drivers are available for these. Other USB floppy disk drives may require other drivers and may therefore not work.

Regarding the external storage devices

You can use an external storage device as the output media instead of a printer and store your outputs such as screenshots and diagnostic protocols, on the storage device. These outputs can then be displayed and printed out from a PC (refer to /3/). You can connect a USB memory stick or a USB floppy disk drive. If both media are connected at the same time then the output is directed to the USB memory stick.

With the print function you can set the output medium and safely remove a removable data carrier.

3 Operation

This chapter describes the operation of the VAS 5051B hardware . Operation of the masks displayed on the tester is described in Operating Manual, VAS 505x "Software", /3/.

3.1 Tester

3.1.1 Powering up the tester

Switch on the tester by pressing the On/Off button on the front panel of the tester (see Fig. 3-1) or by connecting the tester to the vehicle's on-board electrical system via the diagnostic cable (only when the vehicle battery is sufficiently charged).

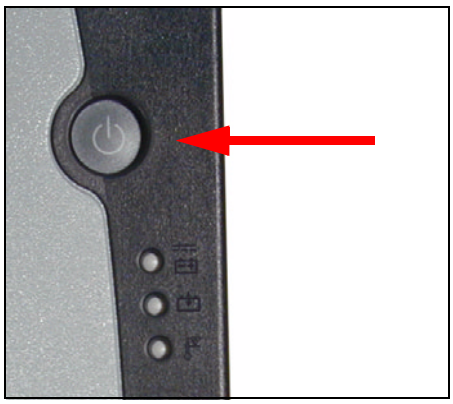

Fig. 3-1 Position of the On/Off button at the tester

The tester then starts up. In this phase, "VAS 5051B" appears for a short time on the touch screen.

The tester is ready for operation when the message regarding the change of the station's name (if this has not yet been carried out) and the safety instructions are confirmed and the ↗start mask is displayed (see /3/).

However, if a new 'base CD' has previously been installed (complete with formatting) then the screen must first be calibrated. More information on this is contained in /3/.

Note

Do not attempt to operate the tester during startup.

If the tester is connected to your LAN workshop network, it will automatically carry out a ↗net update during startup after being switched on.

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If the expiry date of the installed ↗'base CD' has passed, the following message will appear during startup:

The expiry date of the installed software
version <version number>
has passed.
Please install current base CD.

The tester can be used even though the expiry date has passed.

3.1.2 Touch Screen

The entire touch-sensitive surface of the screen is the touch screen. It reacts to the touch of human fingers or of the touch pen and thereby replaces the normal functions of a mouse or keyboard. You can execute any available programme function simply by tapping the corresponding point on the screen.

Note

The screen reacts to all types of touch. When using the tester, make sure that it is protected from unintentional touching by other devices or by persons.

Caution!

Do not use pointed or hot objects or drawing utensils to operate the touch screen. Doing so can damage the touch screen.

Selecting

To ↗select an element of the display (text or button), you must tap the corresponding point on the screen. The selected element will be highlighted. You will see its colour change. Text items turn white and are marked with a black ↗selection bar; buttons turn dark grey (see /3/). As long as you are touching the screen you can change the current selection by moving the touch target. If you stop touching the screen then the selected element is activated.

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3.1.3 Switching off the tester

Switch off the tester by pressing the On/Off button again (Fig. 3-1). Switch-off is complete when the touch screen blanks out.

For switching off, refer also to Section 2.2.2.1.

3.1.4 Using the tester as a table unit

If you are using the tester as a table unit then completely flap open the standing leg. The hinge must be pressed down manually until it snaps into place. This ensures that the tester can be set in a stable manner into its slanting position.

3.1.5 Interfaces

Most of the interfaces are easily accessible behind a protective cap. To adapt a USB cable, for example, pull the appropriate protective cap (see Fig. 2-5) to the side.

The PCMCIA interfaces are not freely accessible; they are located under the protective cap at the top right (see Fig. 2-7, 4). The window on the rear allows you to monitor the control LEDs on the PCMCIA card.

To install PCMCIA cards, proceed as follows:

1. Remove both screws on the corner piece to the right (see Fig. 3-2, 1) using a T8 Torx screwdriver.
2. Remove the protective cap.
3. The PCMCIA slots can now be accessed (Fig. 3-2, 2); insert the expansion card.
4. Replace the protective cap. Caution: Do not turn the screws too tightly.

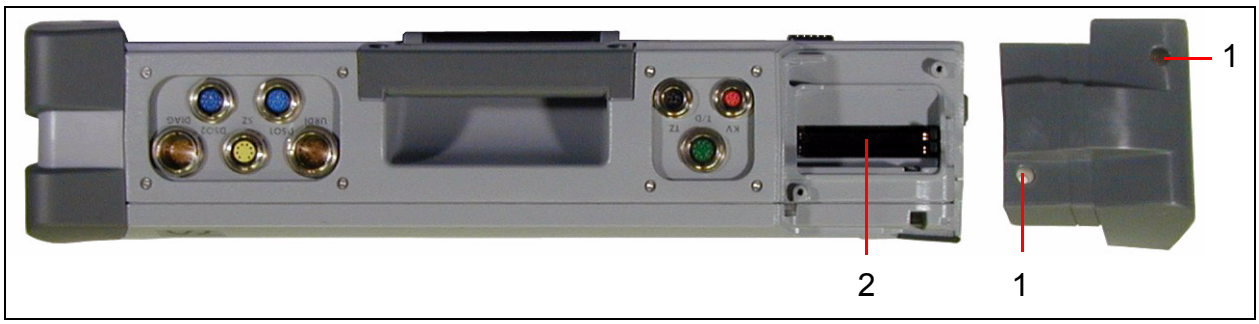

Fig. 3-2 Accessing the PCMCIA interfaces

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3.2 Workshop Trolley

The workshop trolley is used for mobile use of the tester in the workshop. It is mounted on four rollers to allow it to be easily pushed within the working environment.

Depending on the design of the system, one of the following is used:

- Fa. Knürr workshop trolley
- Fa. Rawotec workshop trolley
- a re-equipped VAS 5051 workshop trolley (for operation, refer to /5/)

All workshop trolleys are equipped with a dust-protective cover. It can be folded together during operation and stored in the storage compartment of the workshop trolley.

Note

When the VAS 5051B is not in use, the mains connector should be pulled and the dust-protective cover should always be pulled over the workshop trolley.

Mobility

Both front wheels of the workshop trolley have been equipped with brakes to allow it to be fixed at its location.

Release the brakes to move the trolley. You can push or pull the trolley to its new location using the grips on the front and rear. You can then lock the brakes at the new location.

You can change your work location when the tester is switched on as long as there is sufficient charge remaining in the battery. Disconnect the mains cable from the mains and re-establish the power supply at the new workplace.

You can also disconnect the tester from the table power adapter when switched on in order, e.g. to take the tester into the vehicle. Open the lock at the handle and remove the tester from the tester mount. As soon as the tester is connected via the diagnostic cable to an vehicles' on-board electrical system with sufficient power, it will be supplied with power from the vehicle's battery. Observe LED 1. It changes to green or yellow when power is supplied from the vehicle.

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Ergonomics

There is a hinged cable arm to allow you to put down the diagnostic and measurement cables ergonomically. Additionally, there is a holding fixture for looped cable to the rear of the Knürr workshop trolley.

You can change the angle of inclination of the tester and its mount on the workshop trolley from Fa. Rawotec and on the re-equipped VAS 5051 workshop trolley. This allows you to adjust them ergonomically to the various working positions.

To change the angle of inclination at the Fa. Rawotec workshop trolley:

1. Grip the tester mount from below at the front and pull it up. You can clearly hear when the mount snaps into its various positions.
2. After you have set the required angle, you must replace the keyboard mount into its horizontal position. To do this, pull on the lock on the right side of the tester mount.

If you place the tester mount into its highest position then the locking mechanism releases and the mount can once more be placed in its vertical position.

How to change the angle of inclination at the re-equipped VAS 5051 workshop trolley:

1. Grip the tester from above and below and swing it along the horizontal axis.

3.2.1 Using the tester without a workshop trolley

The tester has been designed for preferred use with the delivered workshop trolley. If the tester is required during test drives then please observe the following:

Warning!

During test drives, secure the tester with a strap on the vehicle's back seat and connect it to the vehicle using the diagnostic cable. A second person must operate the tester from the back seat. Operation from the front seat is too dangerous, e.g. in the event of airbag activation.

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3.3 Diagnostic and measurement cables

Diagnostic and measurement cable connections are coded by colour and mechanically. The cable bushing matches the colour of the sockets. The mechanical coding requires that the red point of the connector is aligned with the red point at the plug when establishing a connection. The plugs can easily be inserted into the sockets without using much pressure when so aligned.

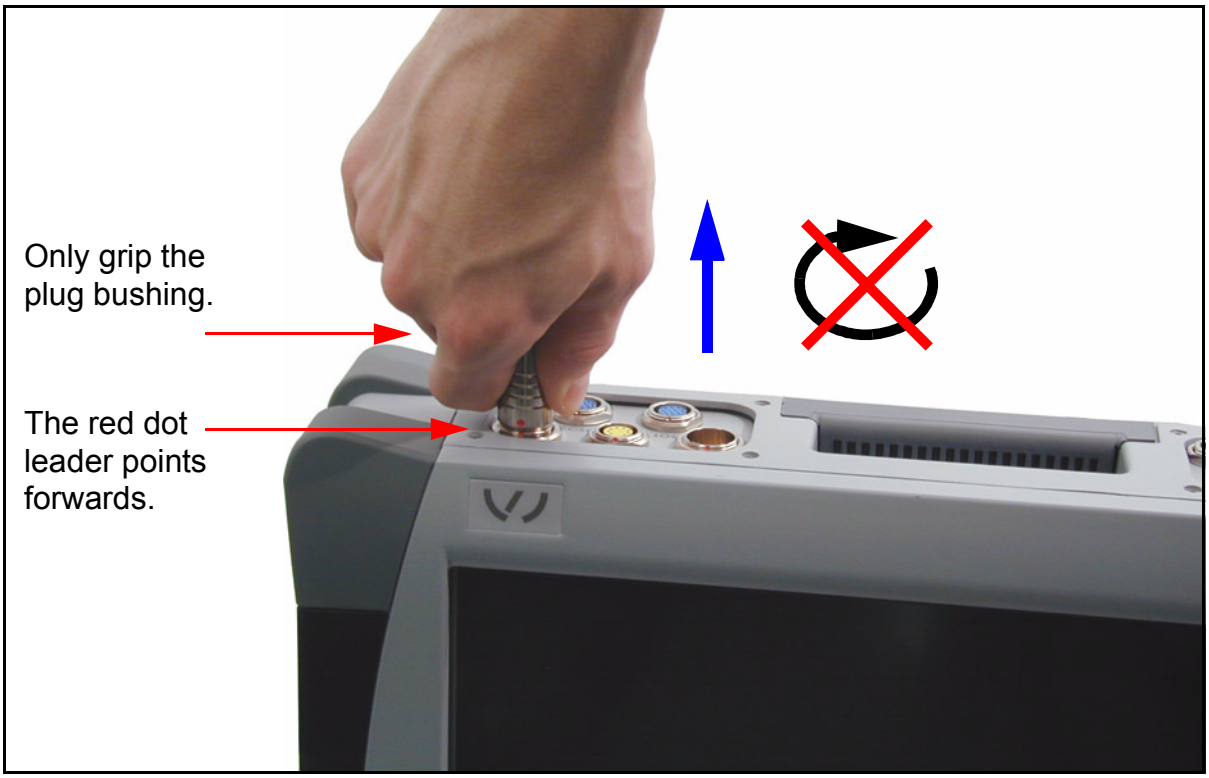

Fig. 3-3 Correct handling of a plug at the tester

To disconnect a plug from the tester, pull the locking collar of the plug upwards, thereby also pulling the plug from the socket.

Note

The plugs are not threaded and turning them with force may damage them (see Fig. 3-3).

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3.3.1 OBD adapter cable (VAS 5052/16) for non-VW vehicles

To connect non-VW vehicles, always connect the adapter cable between the diagnostic cable and the vehicle.

Caution!

The VAS 505x diagnostic devices were developed for vehicles from the Volkswagen group. If the tester is connected directly to vehicles from other manufacturers, damage to the vehicle could result.

Therefore if vehicles of other makes are to be tested using the general OBD functions in the self-diagnosis application, the OBD adapter cable VAS 5052/16 needs to be connected between the diagnostic cable and the diagnostic connection on the vehicle (with fewer cable connections).

3.4 Printer

The OKI B4350 LED printer is used for printing out screen masks, measurement results, etc. It is loaded with DIN A4 paper for the European version, and for the USA version with US letter paper.

The OKI Microline 22L printer is used in Japan.

Details on how to operate the printer are contained in /6/.

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4 Troubleshooting

The VAS 5051B has been fully tested before being dispatched from the factory. Carefully chosen components and adherence to numerous quality controls guarantee high reliability for the VAS 5051B. However, if a problem does occur then please read the instructions in this chapter before contacting the appropriate customer service (see /4/).

4.1 Classification

Faults that can occur at the VAS 5051B can be divided into the following:

- Faults caused by environmental conditions: Environmental temperature, (aggressive) humidity/damp, dust, soot, grease, flying sparks, mains, transformers, large engines, radio communication systems, vibration
- Faults at the VAS 5051B: tester, battery, workshop trolley, mains distribution at the workshop trolley, diagnostic and measurement cables, printer, interfaces

Please try to determine what the fault is and to locate it as exactly as possible. Follow the suggestions for solving the problem and carry out all measures suggested when possible.

If the fault can not be remedied by the measures provided here then follow the instructions in Section 4.4

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4.2 Self-test

The self-test sequence is described in the Operating manual VAS 505x, "Software", Chapter "Administration".

4.2.1 Self-test of the test instruments and the diagnostic bus unit

If there are problems with test instruments or the diagnostic bus then the self-test available in the Administration should always be carried out.

If you receive fault reports after this self-test, please contact Customer Service.
See Section 4.4.

4.2.2 Self-test of the online connection

If there are problems with the connection to the Workshop network, you should perform the self-test in the administration/network settings. See /3/.

If you receive fault reports after this self-test, please contact your local IS consultant (information system consultant).

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4.3 Symptoms, Causes and Solutions

4.3.1 Tester

Table 4-1 Possible fault characteristics

Symptom	Possible causes	Remedy
The system "stops responding". The touch screen can not be operated.	Internal fault.	Switch the tester off and back on again.
The cursor does not follow the touching of the screen, or does so imprecisely.	The screen is not calibrated or screen calibration was incorrect.	Carry out a ↗screen calibration.
		If the device can no longer be operated using the touch screen then re-install the ’base CD’, see /3/.
The tester does not start or starts in battery mode (LED1 lights up orange).	The power supply has been interrupted.	Make sure that the table power adapter is correctly connected.
The tester does not start and the LEDs do not light up in spite of there being a correct power supply.	The battery has completely drained.	Charge the battery.
LED 1 flashes green and orange alternately.	The battery is defective or has been removed.	Make sure that the battery connection cable is correctly connected. When necessary, replace the battery according to Section 5.2.3.
LED 3 flashes red. The tester switches off after approx. 10 s.	There has been an overtemperature in the tester during operation.	Allow the tester to cool down. If LED 3 lights up when the device is within the normal temperature range, then please send a fault report fax.

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Table 4-1 Possible fault characteristics

Symptom	Possible causes	Remedy
Battery mode does not function.	The battery or the charging circuit is defective.	Check whether the load indicator (LED 2) is still lit. If it indicates that there is only a short charging time remaining and the power of the battery has dropped recently then the battery may be used up. Maintain the battery in accordance with /3/. When necessary, replace the battery according to Section 5.2.3.
• Message ***Low Battery You should change your battery or switch to outlet power immediately to keep from losing your work.***	Battery is flat	- Acknowledge the message. - Connect the workshop trolley to the mains and establish the power connection for the tester via the DC connection to charge the battery.
Error message ***Fatal Error.***	System error	Switch the tester off and attempt a re-start. If you continue to receive this error message, then please send a fault report fax.
Error message ***No replaceable drive found, ...***	External storage device not connected or connected incorrectly.	Check the connection of the USB memory or of the USB disk drive.

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4.3.2 Diagnostic bus, diagnostic cable

Note

The function tests of the diagnostic cable and the diagnostic adapter described in the following may only be carried out on vehicles free of defects to ensure that the test delivers usable results.

If you discover a defect or if the relevant cable does not function even though the test was performed with the result OK, please contact customer service.

4.3.2.1 Diagnostic cable

Table 4-2 Error messages at the diagnostic cable

Fault report	Possible causes	Remedy
Error message ***diagnostic bus faulty***.	Diagnostic cable not connected correctly at the tester or the vehicle.	Check the connections of the diagnostic cable at the vehicle and the tester.
	Diagnostic bus or cable is faulty.	Carry out a self-test on the diagnostic bus.

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4.3.2.2 Diagnostic adapter (for older vehicles)

Carry out a function test of the diagnostic adapter (Section 2.5.2) as follows. If the test results do not match the required values then there is a fault in the diagnostic adapter. In this case, please submit a fault report in accordance to Section 4.4.

1. Connect the tester to the vehicle using a fully functional diagnostic cable and diagnostic adapter. Switch on the ignition.
2. Switch-over to the Vehicle Self-Diagnosis operating mode and select the "Engine Electronics" vehicle system (see /3/).
3. If the circuits are functional then information regarding the type of vehicle system is displayed in the right part of the mask after a few seconds.

   If the K or the L circuit is interrupted then the following message is displayed on the top left of the window:

   Vehicle system not available.

   If the power supply line in the diagnostic adapter is interrupted then the following message appears:

   No voltage or voltage too low on diagnostic bus.

4.3.2.3 Diagnostic cable LT2

Carry out a function test of the diagnostic cable LT2 as follows. If the test results do not match the required values then there is a fault in the diagnostic cable LT2. In this case, please submit a fault report in accordance to Section 4.4.

1. Connect the tester to a vehicle via the diagnostic cable LT2.
2. Switch-over to the Vehicle Self-Diagnosis operating mode and select the "Engine Electronics" vehicle system (see /3/).
3. Switch on the ignition. If the circuits are functional then information regarding the type of vehicle system is displayed in the right part of the mask after a few seconds.

   If the K or the L circuit is interrupted then the following message is displayed on the top left of the window:

   Vehicle system not available

   If the power supply line in the diagnostic cable LT2 is interrupted then the following message appears:

   No voltage or voltage too low on diagnostic bus.

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4.3.3 Test instruments

The test instruments are comprised of the test instrument board and the connected measurement cables. However, the self-test in the tester that can be called up for the test instruments does not include the measurement cables. This must be checked by means of comparative measurement if necessary.

Before starting to test the measurement cables, you should carry out a self-test on the test instrument unit in order to exclude that it is faulty. See /3/.

The test instruments can also display messages regarding measurement faults independently. The following table shows an example:

Table 4-3 Fault report of the test Instruments

Symptom	Possible causes	Remedy
When measuring the resistance and the continuity, the following error message appears: ***Measurement error: external power supply***.	The component to be tested is live.	Switch off the external power supply.

4.3.3.1 Test instrument unit

The test instrument unit is tested by the self-test that is built into the tester. In case of an error, a fault number appears in the work window: If "OK" is shown in the window then the test instrument unit is OK.

If the test instrument unit produces a fault report then you should make a screenshot for later proof.

4.3.3.2 Measurement cables

U/R/D/I measurement cable

A function test of the U/R/D/I measurement cable is carried out as follows. If the test results do not match the required values then there is a fault in the corresponding U/R/D/I measurement cable. In this case, please submit a fault report in accordance to Section 4.4.

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The U/R/D/I measurement cable is best checked using a comparative measurement. Check the "voltage measurement" function, e.g. by connecting the leads to a vehicle battery.

In the "resistance measurement" function, simulate an "open circuit" (Display: +++++ MΩ) and "short-circuit" (near the display of 0.000 kΩ). You can also measure known resistances, e. g. of a relay coil (normally approx. 90 Ω).

When checking the diodes, you can also simulate an "open circuit" and "short-circuit". However, a diode is required for additional tests. Check whether the appropriate symbols (see /3/, Chapter Test Instruments) are displayed.

To check the "↗ inline current measurement" function you must use a circuit of max. 2 A.

DSO measurement cables

Carry out a function test of the DSO measurement cables as follows. If the test results do not match the required values then there is a fault in the corresponding DSO measurement cable. In this case, please submit a fault report in accordance to Section 4.4.

1. Connect a DSO measurement cable to the DSO1 socket.
2. Press the Voltage DSO1 button in Test Instruments operating mode, Multimeter mask. Select DC voltage as the type of measurement and the automatic range selection.
3. Connect the measuring tips of the DSO measuring cable with a charged car battery.. The measurement value that is displayed must be the same as the battery voltage (between 11 and 14 V).
4. Check the freeze image selection by pressing the button on the red/black probe tip. The measurement value is frozen, the "freeze frame" button must appear to be pressed on the screen.

Carry out a comparative measurement between U/R/D/I and DSO:

1. Release the freeze frame by pressing the button again in order to continue the measurement.
2. Additionally connect the U/R/D/I measurement cable to the tester and the vehicle battery. Its correct functioning should have been checked before connecting it.
3. Press the Voltage U/R/D button. Select DC voltage as the type of measurement and the automatic range selection.
4. In both displayed measurement functions (DSO1 and U/R/D), the difference in the measured values must be ≤ 0.2 V.

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Repeat the function test with the second DSO measurement cable.

Note

Both DSO measurement cables are identical and can be exchanged for testing.

Current pick-ups

Carry out a function test of the current pick-ups as follows. If the test results do not match the required values then there is a fault in the current pick-up. In this case, please submit a fault report in accordance to Section 4.4.

1. Connect a current pick-up to the tester.
2. Press the Current pick-up button in Test Instruments, mask Multimeter. The current pick-up must be automatically recognized. Select DC current as the type of measurement and the automatic range selection.
3. Open and close the current pick-up several times without connecting it to a live cable. The value measured must change considerably between these two states (open and closed). In case of the 100 A pick-up, check whether the LED at the current pick-up correctly displays the conditions "opened (LED is on) / closed (LED is off)".

Now check the calibration of the current pick-up:

1. Press the Calibrate button on the screen. Close the message displayed by pressing the OK button. At most, the measured value displayed after calibration must equal the tolerance in the lowest measurement range (see Section 6.3.1).
2. Connect the current pick-up to a battery cable or another cable of a consumer in a vehicle. All consumers and the ignition of the vehicle should be switched off at first. The displayed measurement result should only change marginally (environmental influences).

How to perform a comparative measurement:

1. Switch on a consumer, e.g. the parking light. The power consumption should be known as accurately as possible. Take this value as a starting point. The measured value should be the same as this value.
2. Pull the current pick-up from the cable carrying the current and plug it back in, reversed by 180°. The difference must remain within the stipulated tolerance (see Section 6.3.1).

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Trigger clamp and kV pick-up

The trigger clamp and kV pick-up can only be tested together. Carry out a function test as follows. If the test results do not match the required values then there is a fault in one of the sensors. In this case, please submit a fault report in accordance with Section 4.4.

1. Connect the trigger clamp and the kV pick-up to the tester.
2. Call up the DSO mask in operating mode Test Instruments, (see /3/).
3. Connect both pick-ups via the same ignition cable (secondary side of the ignition coil) to a vehicle with a 4 or 6 cylinder engine.
4. Press the Preset measurement button in the DSO mask, select the Secondary ignition voltage curve in the selection list that appears, and confirm with the Display button. The DSO mask will appear with the set curve in the background. At the same time, all DSO settings will be made automatically.
5. Start the vehicle's engine. The typical ignition signal must be displayed dynamically, i.e. the picture is re-written once or twice per second if the kV pick-up and trigger clamp are working correctly.

If the trigger clamp is faulty then the following message appears in the window at the top right:

No trigger

If the kV pick-up is faulty then a horizontal line may only be displayed or else a signal curve with much too small an amplitude.

Note

Depending on the type of vehicle used, the amplitude of the ignition signal may fluctuate between 4 and 40 kV. The combustion voltage is normally between 600 and 1200 V, and the combustion duration should be between 1 and 6 ms. The shape of the curve may vary depending on the manufacturer of the ignition coil.

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4.3.4 The printer

If the output at the printer is faulty or the printer does not print then check the text output at the display. Check

- whether the printer is switched on and/or is online
- whether there is paper in the printer
- whether there is a paper jam in the printer
- whether the connection to the tester is interrupted
- whether the output medium at the tester is set correctly ("Print", menu, "Select output medium" – see /3/)
- whether the printer driver/paper format is set correctly (under "Administration - Printer Settings" – see /3/)

If the printer still does not print or the print-out is faulty then consult /6/.

When operating the printer via the IrDA adapter of the VAS 5051 workshop trolley, the following message may be displayed from time to time:

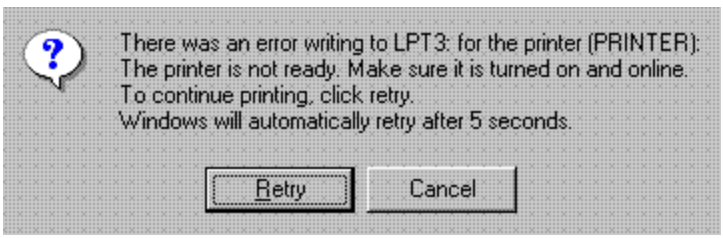
There was an error writing to LPT3: for the printer (PRINTER):
The printer is not ready. Make sure it is turned on and online.
To continue printing, click retry.
Windows will automatically retry after 5 seconds.
Retry
Cancel

Fig. 4-1 Message from printer driver

This message appears when the print job cannot be processed immediately. This message disappears automatically when the print job can be processed. The meanings of the acknowledgement buttons are:

"Retry": repeat the print job

"Cancel": delete the print job

4.4 Fault Reports to Customer Service

If the fault that has occurred cannot be remedied then please consult the customer service. Fur further information see /4/.

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4.5 Replacement Parts and Accessories

4.5.1 Overview

During the guarantee period, repairs to the VAS 5051B are made by replacing defined components. In case of submitting a fault report to your appropriate customer service you will be informed which components will be replaced under guarantee conditions. You will then receive one or more replacement parts on the instigation of the guarantor. These parts are divided into exchange parts, replacement parts and repair parts.

- **Exchange parts:** Some components of the VAS 5051B are exchange parts that you must return in exchange for a new or repaired component. You will be told the address to send the defective exchange parts to as required. The components sent can also be replaced by a repaired exchange part. You have no claim to receive new parts.
- **Replacement parts:** You can dispose of replacement parts yourself. Please observe your national regulations on the disposal of such parts.
- **Repair parts:** Send repair parts to the supplier. After the repairs your components/ parts will be returned to you and you can install them yourself.

Section 4.5.3 lists all parts and informs you of whether a particular part is an exchange part, a replacement part or a repair part.

In certain cases, the guarantor may also demand that you return components that are not normally exchange parts.

4.5.2 General notes

Tester

If the tester (without accessories) must be replaced then you will receive a replacement device in a box that you should also use to send back your defective device. Return complete tester after removing the accessories **(Remove battery, table power adapter and any PCMCIA cards you may have inserted)**.

Cables

Defective diagnostics and measurement cables are replaced completely. If the mains cable has to be replaced, then observe the technical data in accordance to Section 6.5 and the assembly instructions (see the start-up instructions).

Battery

Replace the battery in accordance with Section 5.2.3.

USB cable (only for workshop trolley VAS 5051B)

The cable connects the printer to the tester.

1. Check whether the cable is connected to the tester and the printer.
2. Check whether the cable is damaged. If it is damaged, then replace the 1.8 m USB cable.

IrDA Adapter (only for the VAS 5051 workshop trolley)

The IrDA adapter cable is attached to the workshop trolley with a cable relief that is not part of the delivery of the exchange part.

1. Pull the IrDA adapter towards the open side of its mount from the workshop trolley.
2. Pull the cable at the workshop trolley from the guide of the side boom (keep the rubber parts safely for future use).
3. Remove the round plastic lid from the sidewall behind the boom to the right of the trolley.
4. Release the centronics plug from the printer.
5. Release the cable relief and remove the IrDA adapter.

Mount the new IrDA adapter by reversing the order of steps 1 - 5 in the above.

Workshop Trolley

To obtain spare parts for the VAS 5051B workshop trolley, please contact the manufacturer (Fa. Knürr, Fa. Rawotec, see /4/).

For spare parts for the re-equipped VAS 5051 workshop trolley see /5/. For new tester mounts, please contact Fa. Knürr.

4.5.3 Parts List for the VAS 5051B

The following types can be delivered:

System delivery with workshop trolley VAS 5051B, models:

- Fa. Knürr
- Fa. Rawotec

Re-equipped VAS 5051 incl.

- Fa. Knürr tester mount for the VAS 5051 workshop trolley

Table 4-4 Symbols and Abbreviations

Symbol	Meaning
●	Part of the system delivery
❍	Accessories
✓	Can be taken over when re-equipping the VAS 5051

ID	Meaning
A	exchange part
E	replacement part
R	repair part

No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
	Tester								
1	Tester	●	●	VAS 5051B/13	A5E00262287	ASE40528200000	SIEMENS	A	'Base CD' pre-installed

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
2	Table power adapter	●	●	5051B/17	A5E00297492	ASE40528700000	SIEMENS	E	Without mains cable
3a	Mains cable, for table power adapter, type EU, 3 m	●	✓		A5E00088672		SIEMENS	E	
3b	Mains cable, for table power adapter, type US, 3 m	●	✓		A5E00145150		SIEMENS	E	
4	Battery pack, lithium ion, 14.8 V	●	●	5051B/14	A5E00262564	ASE40528200000	SIEMENS	E	
	Tester, small parts								
5	Fan with cable				A5E00262556		SIEMENS	E	2 pieces

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
6	Set of corner pieces (2 x corner piece 1, (1 x corner piece 2, 1 x cover of wireless card)				A5E00295901		SIEMENS	E	
7	Set of covers incl. fixing strips and screws				A5E00343305		SIEMENS	E	Rubber covers over interfaces
8	Coated insert handle				A5E00273602		SIEMENS	E	Top handle
9	Touch pens 3, as spare parts			5052/11	A5E00133742	ASE40517500000	SIEMENS	E	For operating the screen

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
	Diagnostic and measure-ment cables								
10	5 m diagnostic cable	●	●	5051B/1	A5E00276114	ASE40527000000	SIEMENS	E	
11	3 m diagnostic cable	❍	❍	5051B/2	A5E00328205	ASE40527100000	SIEMENS	E	No technical difference to the 5 m diagnostic cable
12	Diagnostic cable LT2	❍	✓	5051B/3	A5E00310809	ASE40527200000	SIEMENS	E	For commercial vehicle systems LT2
13	Test adapter cable	●	●	5051B/4	A5E00314690	ASE40527300000	SIEMENS	E	for the self-test Diagnostic bus

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
14	Diagnostic adapter	●	✓	5051/2	C79298-A3238-B505	ASE40556000000	SIEMENS	E	For older vehicle systems
15	OBD adapter cable	❍	✓	VAS 5052/16		ASE40518200000	VW	E	For connecting vehicles from another source
16	U/R/D/I measure-ment cable	●	●	5051B/5	A5E00262596	ASE40527400000	SIEMENS	E	
17	DSO measure-ment cable (1 piece)	●	●	5051B/6	A5E00276115	ASE40527500000	SIEMENS	E	2 delivered with the system, 1, as spare part
18	Replacement test probe tips for U/R/D/I and DSO cable for red/black test probes	●	●	5051B/17	A5E00328217	ASE40528600000	SIEMENS	E	5 pieces, with screw-in thread

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
19	100 A current pick-up	●	50 A can be used	VAS 5051B/7	A5E00276116	ASE40527600000	SIEMENS	E	
20	1800 A current pick-up	❍	500 A can be used	5051B/8	A5E00328211	ASE40527700000	SIEMENS	E	
21	kV pick-up	●	✓	5051/17	C79298-A3238-B535	ASE40506300000	SIEMENS	E	For measuring ignition voltages
22	Trigger clamp	●	✓	5051/18	C79298-A3238-B540	ASE40506400000	SIEMENS	E	For triggering the DSO
23	Temperature sensor	❍	❍	5051/70			VW	E	

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
24	Pressure sensor -1 to 1 bar	❍	❍	5051/58			VW	E	
25	Pressure sensor -1 to 4 bar	❍	❍	5051/59			VW	E	
26	Pressure sensor 0 to 60 bar	❍	❍	5051/60			VW	E	
27	Pressure sensor 0 to 400 bar	❍	❍	5051/61			VW	E	
	Mains cable and distributor, workshop trolley								
28a	EU mains cable (Type A) 6 m	●	✓		A5E00328613		SIEMENS	E	Mostly in Europe
28b	US mains cable (Type B) 6 m, oil-resistant	●	✓		A5E00328614		SIEMENS	E	Mostly in North America and Central America
28c	UK mains cable (Type C) 6 m	●	✓		A5E00328615		SIEMENS	E	Mostly in Great Britain

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
28d	AF mains cable (Type D) 6 m	●	✓		A5E00328616		SIEMENS	E	Mostly in West South Africa and Namibia
28e	Mains cable (Type F) 6 m	●	✓		A5E00328617		SIEMENS	E	Mostly in Australia and New Zealand
28f	CH mains cable (Type H) 6 m	●	✓		A5E00328618		SIEMENS	E	Switzerland
28g	IL mains cable (Type I) 6 m	●	✓		A5E00328619		SIEMENS	E	Israel
28h	CN mains cable (Type L) 6 m	●	✓		A5E00328620		SIEMENS	E	China
28i	BR mains cable (Type B2) 6 m	●	✓		A5E00342908		SIEMENS	E	Brazil

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
28j	J mains cable (Type B3) 6 m	●	✓		A5E00342909		SIEMENS	E	Japan
29a	EU power outlet strip	●	✓				Fa. Knürr	A	
29b	US power outlet strip	●	✓				Fa. Knürr	A	
	Printer								
30a	Printer OKI B4350, EU-version	●	✓	VAS 5051/51A	A5E00342949	ASE 40507503000	VW	A	Printer, 220-240 V
30b	Printer OKI B4350, US-version	●	✓		A5E00342951		VW	A	Printer, 120-127 V
30c	Printer OKI Microline 22L, Japan version	●	✓		A5E00343012		VW	A	Printer, 100 V

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
31	USB cable 1.8 m	●	❍		A5E00273189		SIEMENS	E	Not required for re-equipping the VAS 5051 workshop trolley
32	Picture drum unit for printers OKI B4350 and B4300			VAS 5051/52		ASE40507602000	OKI/VW	E	
33	Toner for printers OKI B4350 and B4300			VAS 5051/53		ASE40507702000	OKI/VW	E	
	Workshop trolley								
34a	Workshop trolley, Fa. Knürr			5051B/9		ASE40527800000	Fa. Knürr		

No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
34b	Single tester mounts for re-equipping of the VAS 5051 workshop trolley, Fa. Knürr			5051B/10	A5E00262594	ASE40527900000	Fa. Knürr		
34c	Workshop trolley, Fa. Rawotec			5051B/11		ASE40528000000	Fa. Rawotec		
	USB keyboard and USB mouse								
35a	Compact keyboard US	●	●	5051/B23	A5E00348261	ASE40529200023	SIEMENS	E	American English
35b	Compact Keyboard I	●	●	5051/B23	A5E00348257	ASE40529200050	SIEMENS	E	Italian

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
35c	Compact Keyboard F	●	●	5051/B23	A5E00348244	ASE40529200040	SIEMENS	E	French
35d	Compact Keyboard E	●	●	5051/B23	A5E00348234	ASE40529200060	SIEMENS	E	Spanish
35e	Compact Keyboard D	●	●	5051/B23	A5E00348227	ASE40529300000	SIEMENS	E	German
36	Optical power wheel mouse	●	●	5051/B24	A5E00348221	ASE40529200023	SIEMENS	E	

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No.	Identification	Model		VAS No.	Manufacturer's number	VW number	Supplier	Type	Comments
		System delivery	Re-equipping						
	Documentation								
37	Start-up/ Unpacking instructions	●	●		A5E003090**xx** language-specific		SIEMENS	E	
38	Operating Manual, VAS 5051B "Hardware"	●	●	5051B/16	A5E003099**xx** language-specific	ASE40528500000	SIEMENS		on the ’base CD’
39	Operating Manual, VAS 505x "Software"	●	●		A5E003300**xx** language-specific		SIEMENS		on the ’base CD’
40	Brief instructions (folding sheet)	●	●	5051B/15	A5E003299**xx** language-specific	ASE40528400000	SIEMENS	E	Printed version

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5 Care and Maintenance

5.1 Optical check of the VAS 5051B

Carry out a regular optical check of the VAS 5051B. Examine all parts for damage (e.g. breaks) and for dirt.

Check the touch screen for damage or dirt.

Regularly check the device, all cables and the accessories for damage.

Warning!

If the mains cable, a diagnostic or measurement cable, the tester or any accessory carrying live current is damaged, you must not use it until a properly qualified specialist has investigated it and approved it.

5.2 Tester

If the housing is dirty then clean it with a lint-free, damp (not wet!) cloth.

Caution!

Before cleaning the tester, turn it off to ensure safety and pull out the DC supply plug. Remove all measurement cables. Pay careful attention that no liquid enters into the housing. Do not try to clean the insides of the DVD and disk drives.

Caution! Do not overtighten the screws on the housing.

The housing of the tester is made of magnesium. Housing screws must therefore not be screwed in too tightly (just as with aluminium). The build in screw theads may loosen too. Take special care at the corner pieces.

Make sure that the venting slots to the left and right of the tester remain uncovered. remove any dirt using a vacuum cleaner.

If the tester is damaged then please contact the SIEMENS hotline (see /4/).

5.2.1 Cleaning the touch screen

The most sensitive part of the tester is the touch screen. Its sensitivity to touch may be impaired by dirt and by scratches. If it becomes dirty then clean it using a soft, non-lint cloth. If the dirt can not be removed using the cloth then you can use isopropanol or an ammonia-free glass cleaner.

5.2.2 Battery

The battery has a standard lifetime of approx. 500 charge/discharge cycles. It then has a remaining capacity of approx. 50%.

Note

- A lithium ion battery does not require formation.
- The battery must be disposed of or recycled when completely discharged in accordance with the local regulations.

Caution!

- The battery may only be replaced by trained personnel
- Never short-circuit the battery
- Never throw the battery into a fire
- Dispose of or recycle the battery in accordance with the local regulations

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Battery maintenance

Due to age, the usable capacity of the battery decreases and the amount of faults increases when measuring the capacity for the charging circuit. To compensate for this process, a calibration must be carried out from time to time for the battery control. The required maintenance interval is automatically reported by the tester and serves the purpose of optimizing the usable capacity of the battery. Follow the instructions on the screen (see /3/).

5.2.3 Replacing the battery

Caution!

Always replace a defective battery with a new battery. Never operate the device without a battery as the installed operating system may be destroyed if the power supply is interrupted.

You can find the order number and source of supply for the expendable part in the Parts List for the VAS 5051B.

Replace the battery as follows:

1. Place the tester with the screen downwards on an even, clean surface.
2. Remove the four screws on the cover of the battery pack (see Fig. 2-7, 10). To do this, use a T10 TORX screwdriver.
3. Flap up the support leg.
4. Lift the cover from below in the middle and remove it.
5. The battery is fixed by foam part. You can release the battery by pressing the foam part upwards at the right, see Fig. 5-1.

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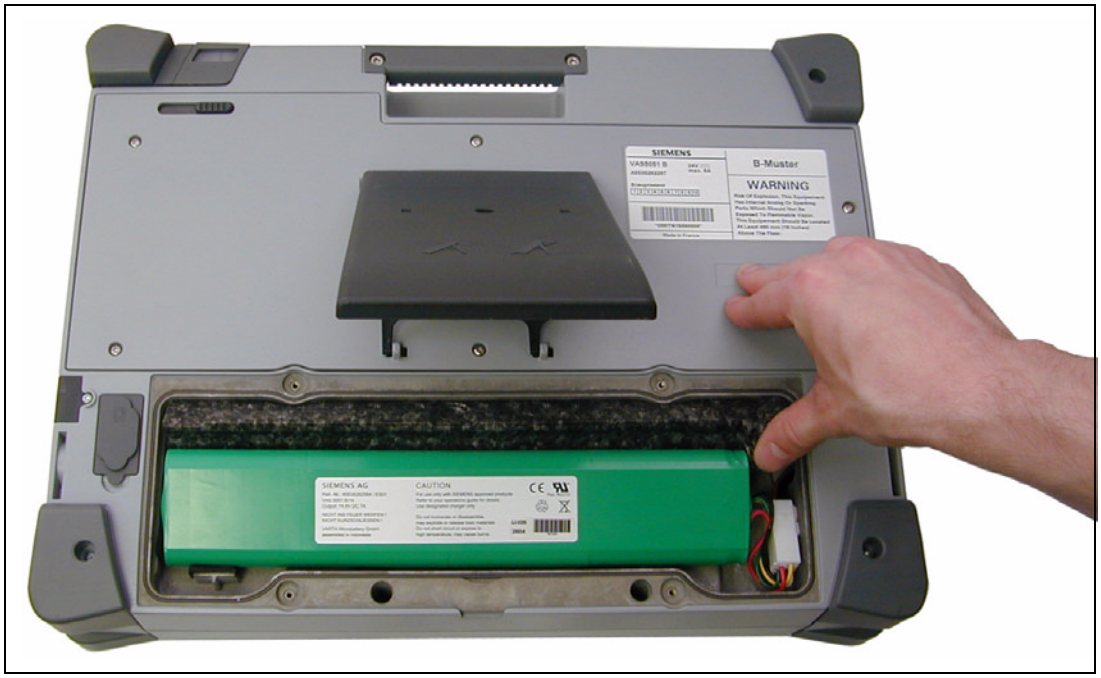

Fig. 5-1 Replace the battery by removing it from the battery compartment

6. Disconnect the plug connection at the battery cable. Press the retaining springs in the middle of both plug components downwards (using your thumbnails) and pull the plug connection apart, see Fig. 5-2.

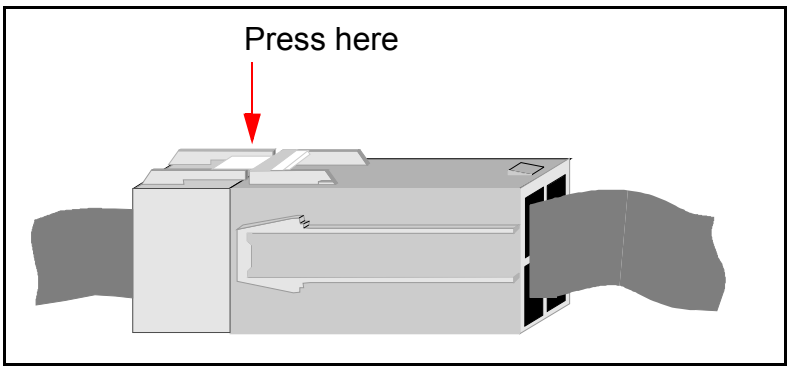

Fig. 5-2 Replacing the battery and releasing the plug connection at the battery cable

7. Replace the old battery with a new battery.
8. Re-connect the previously disconnected plug connection. The plug must snap into the socket.
9. Reassemble all parts. Caution: Do not over-tighten the screws on the housing.

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5.2.4 Replacing the fans

You can find the order number and source of supply for the expendable parts in the Parts List for the VAS 5051B.

Replace both fans as follows:

Remove the fans:

1. Place the tester (switched off) with the screen flat down on an even, clean and cleared surface to ensure that the screen cannot be damaged.
2. Remove the six screws on the cover of the battery pack (see Fig. 5-3). To do this, use a T10 TORX screwdriver.

   One of the six screws is underneath the standing leg. A recess allows you to remove the screw without having to flap up the standing leg.

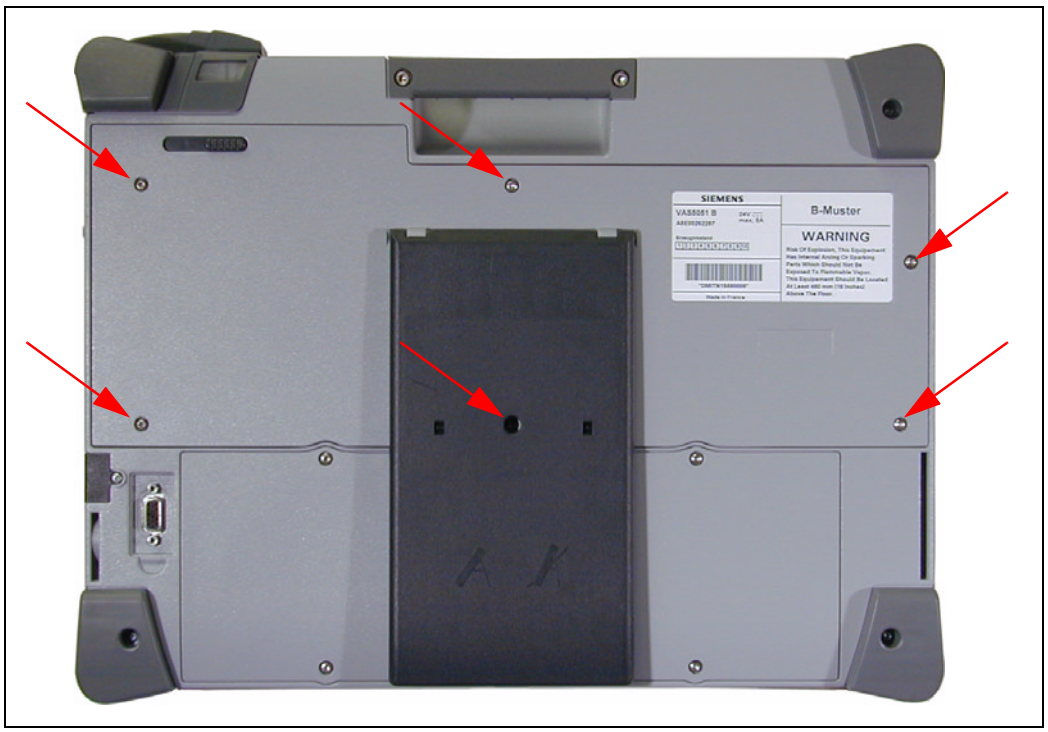

Fig. 5-3 Changing the fans, unscrewing the cover

3. Remove the top cover.
4. Pull the power cable from its position and disconnect both plug connections.
5. Now carefully pull both fans off their installation position.
6. Replace the fans.

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Installing the fans:

7. Hold the sides of the two fans against each other.
8. Place them both simultaneously into their installation position (see Fig. 5-4).
9. Re-establish the plug connections and guide the cable through the recess intended for this purpose (see Fig. 5-5).
10. Re-mount the cover onto the tester. Caution: Do not overtighten the screws on the housing.

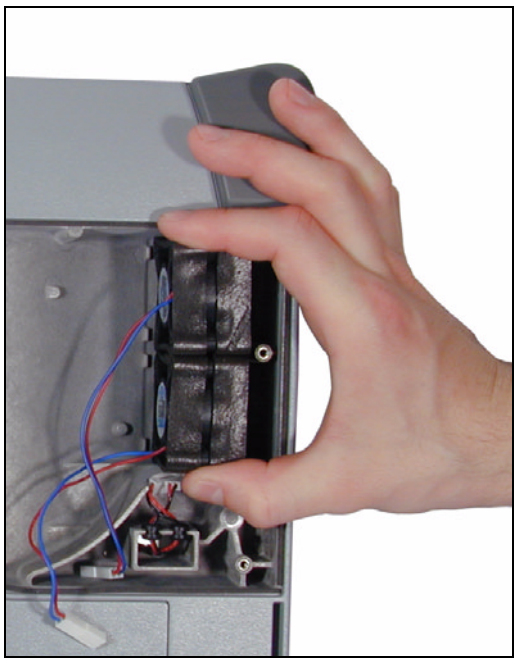

Fig. 5-4 Changing the fans, installing

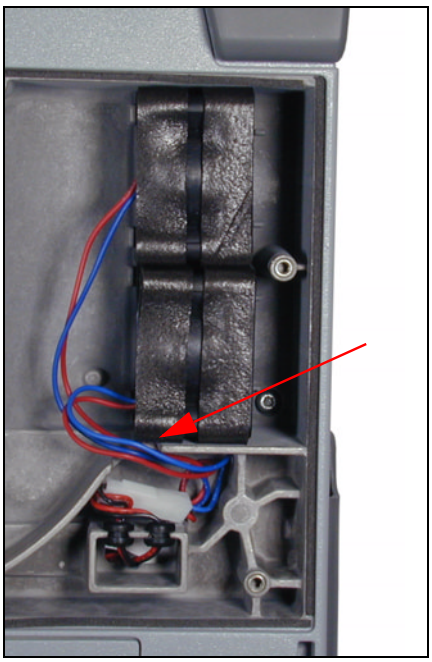

Fig. 5-5 Changing the fans, aying the cable

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5.2.5 Replacing the corner pieces

To replace the corner pieces, proceed as follows:

1. Remove the screws at the rear of the corner pieces (see Fig. 5-6). To do this, use a T8 TORX screwdriver. The right, upper corner piece is fixed by two screws at the top; refer also to Section 3.1.5.
2. Grip the corner piece at the front and rear and carefully pull it upwards.

Caution!

The bluetooth antenna is located underneath the left, upper corner piece. Make sure that it is not damaged during the procedure.

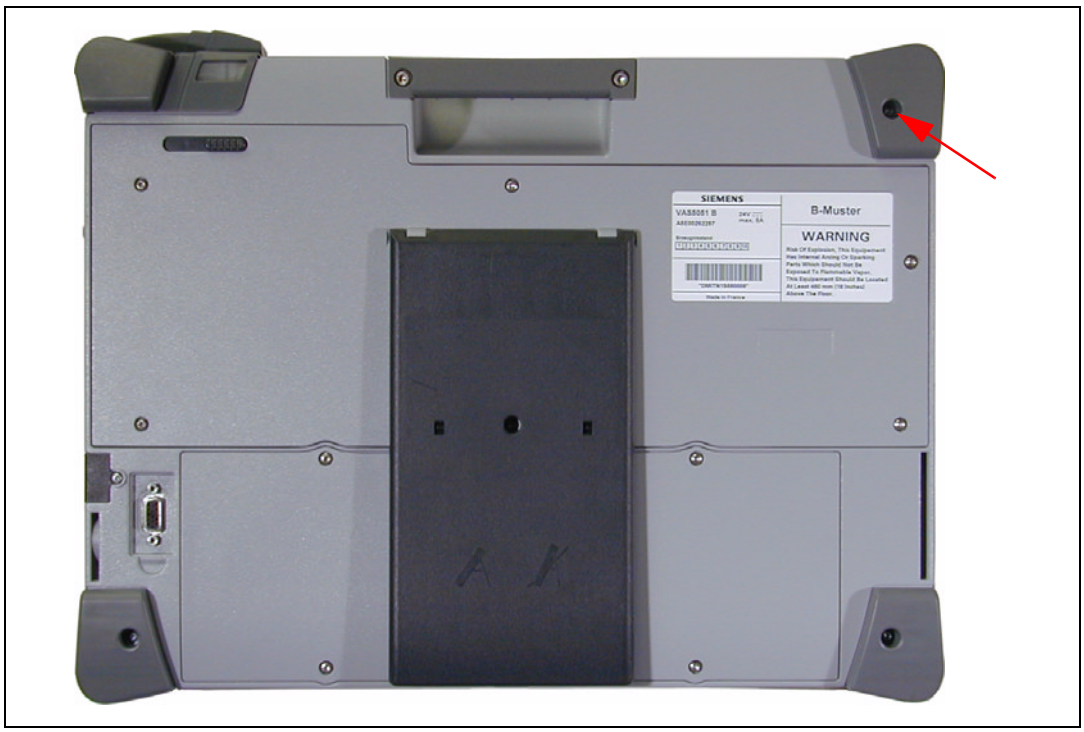

Fig. 5-6 Example: replacing the corner piece to the left

Installing:

3. Carefully insert the new corner piece and fix it using the screw(s).
   Caution: Do not overtighten the screws on the housing.

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5.3 Workshop Trolley

The workshop trolleys are maintenance-free.

5.4 Diagnostic and measurement cables

Regularly check all diagnostic and measurement cables for damage. Replace damaged cables.

5.4.1 Changing the measuring tips on the red/black probe tip

1. Grasp the front part of the measuring tip with flat-nose pliers and turn the probe tip until the part separates.
2. Insert the new test probe tip. The middle section of the test probe tip is hinge-mounted. Only the tip at the plus leads (red/black test probes) can be replaced.

5.5 Printer

Maintenance of the printer is described in /6/.

5.6 Calibration

According to ISO regulations 9000 ff., the measurement accuracy of all measuring equipment that influences the quality of the work carried out (in this case, maintenance and repair work) must be periodically calibrated.

The tester and the measurement cables are calibrated for 3 years on delivery (see Section 1.5). Thereafter, calibration must be repeated every two years.

Before this time has expired, please consult the contact person for the respective brand.

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6 Technical Specifications

6.1 VAS 5051B Tester

6.1.1 Operating Data

Dimensions (W x H x D)	approx. 410 x 310 x 95 mm	
Weight	approx. 7.6 kg	
Ambient conditions		
Operation	Ambient temperature Relative humidity	+5 to +40 °C at max. +25 °C 10 to 80%, non-condensing
Transport and storage	Ambient temperature Relative humidity	-20 to +60 °C at max. +20 °C 10 to 80%, non-condensing
Electrical protection and safety	Safety regulations - Workshop devices: UL 201 - Devices for information processing: DIN EN 60950 (VDE 0805), EN 60950, IEC 950, UL 1950, CSA-C22.2 No. 950 - Testing devices: DIN EN 61010-1 (VDE 0411 Part 1), EN 61010-1, IEC 1010-1 Protection class I (as per DIN EN 60950), relevant for the table power adapter unit only Protected from water and foreign objects as per DIN VDE 0470 Part 1 (EN 60529, IEC 529) - Degree of protection: IP 20 For company-internal use only Pollution Degree II Overvoltage category I	
Power supply	Power is supplied by one of the following, depending on the application: - Table power adapter - Battery - Vehicle on-board electrical system	

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Power supply from table power adapter	
Current consumption	DC 24 V, 5 A
Power supply from the battery	If the external power supply (table power adapter, mains, vehicle on-board electrical system) is interrupted, the tester is buffered with the battery.
Battery type	Lithium ion, 14.8 V
Buffer time	Usually 1 h (depending on operating mode, battery state and the external consumers)
Recharging time (at the mains)	Approx. 2.5 h (only with table power adapter connected)
Power supply from the vehicles' on-board electrical system	The tester can be supplied with power from the vehicle's on-board electrical system
Rated voltages	DC 12 V, DC 24 V
Power consumption in the load range	max. 5 A at 12 V battery voltage
Protection	The input is protected against disturbances acc. to DIN 40839 Part 1, Test Impulses 1 to 4, Test Level IV. The input is protected against reverse polarity.

External interfaces, wired	
COM1 (V.24)	9-pin sub-D plug for RS232/RS485
USB interface	4 x USB standard 2.0
Monitor (VGA)	15-pin sub-HD plug
Ethernet interface	RJ45 socket
Audio input	socket socket 3.5 mm
Audio output	socket socket 3.5 mm
Power output	at 8 Ω load: 200 mW (at 0.1% distortion) at 32 Ω load: 85 mW (at 0.1% distortion)
Chip card reader	Smartcard as per ISO7816
PCMCIA slot	for PCMCIA cards 1 x Type III or 2 x Type II
DC input	2-pin mini SNAP socket, size 2.
Socket panel	
(test instruments)	Mini SNAP sockets
DIAG	Diagnosis interface, 18-pin
URDI	Multimeter, 14-pin, size 3
DSO1, DSO2	Storage oscilloscope, 12-pin, size 2
SZ	Current pick-up, 8-pin, size 2
KV	kV pick-up, 5-pin, size 1
TZ	Trigger pick-up, 5-pin, size 1
T/D	Temperature/pressure, 10-pin, size 2
External interfaces, wireless	
IrDA	Infrared interface for the printer
Bluetooth	Wireless interface for expansions

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6.2 Table power adapter

Table power adapter	The table power adapter supplies the tester from the 230 (110) V mains. The table power adapter is housed in the workshop trolley.
Rated voltage range Rated frequencies	AC 100 to 240 V 50 - 60 Hz
DC cable	The DC cable (approx. 1.2 m) is permanently connected to the table power adapter.
Mains cable (internal) Plug type	The power cable (approx. 3 m) is connected to the mains network in the workshop trolley. Inlet connector for non-heating apparatus, Type C13, EN60320/C13 and for Variant 1: Schuko plug, Type VII as per CEE(7) VII Variant 2: USA plug, Type 498 G as per NEMA 5-15

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6.3 Test Instruments

6.3.1 Multimeter

U/R/D/I multimeter measurement cable

Caution! ***when using the U/R/D/I cable.***

The U/R/D/I cable (with purple identification of the pin plug) is approved only for voltage peaks up to 42 V and current measurements up to 2 A.

Change the cable to measure higher voltages/currents!

DC voltage at U/R/D/I (Ri ≥ 1 MΩ)	*Range*	*Resolution*	*Tolerances*
	-2 to +2 V	0.001 V	±0.5% of m[1]. ±2 mV
	-20 to +20 V	0.01 V	±0.5% of m. ±20 mV
	-50 to +50 V	0.01 V	±0.5% of m. ±50 mV
AC voltage at U/R/D/I (RMS, 50 Hz to 5 kHz, Crest factor max. 3, Ri ≥ 1 MΩ)	*Range*	*Resolution*	*Tolerances*
	0 to 2 V	0.001 V	±1.5% of m. ±4 mV
	0 to 20 V	0.01 V	±1.5% of m. ±40 mV
	0 to 40 V	0.01 V	±1.5% of m. ±80 mV
AC voltage at U/R/D/I (RMS, 5 kHz to 10 kHz, Crest factor max. 3, Ri ≥ 1 MΩ)	*Range*	*Resolution*	*Tolerances*
	0 to 2 V	0.001 V	±5% of m. ±4 mV
	0 to 20 V	0.01 V	±5% of m. ±40 mV
	0 to 40 V	0.01 V	±5% of m. ±80 mV
Direct inline current (Ri ≤ 250 mΩ) via U/R/D/I measurement cable	*Range*	*Resolution*	*Tolerances*
	-0.2 to 0.2 A	0.0001 A	±1% of m. ±1 mA
	-2 to 2 A	0.001 A	±1% of m. ±10 mA
AC inline current (RMS, 30 to 500 Hz, crest factor max. 3, Ri ≤ 250 mΩ) via U/R/D/I measurement cable	*Range*	*Resolution*	*Tolerances*
	0 to 0.2 A	0.0001 A	±1.5% of m. ±1 mA
	0 to 2 A	0.001 A	±1.5% of m. ±10 mA

1.) of measurement value

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Resistance via U/R/D/I measurement cable	The measuring current depends on the measurement range and is 5 mA maximum. *Range* — *Resolution* — *Tolerances*[2)] 0 Ω to 10 Ω — 10 mΩ — ±1% of m. ±5 mΩ 0 Ω to 100 Ω — 0.1 Ω — ±1% of m. ±50 mΩ 0 Ω to 1 kΩ — 1 Ω — ±1% of m. ±1 Ω 0 Ω to 10 kΩ — 10 Ω — ±1% of m. ±10 Ω 0 Ω to 100 kΩ — 100 Ω — ±1.5% of m. ±100 Ω 0 Ω to 1 MΩ — 1 kΩ — ±2% of m. ±1 kΩ 0 Ω to 10 MΩ — 10 kΩ — ±2% of m. ±10 kΩ In case of continuity measurements in the measurement range 10 Ω, an acoustic signal sounds if the test object has a resistance of < 2 Ω. 2) The accuracy in the measurement range of 10 Ω and 100 Ω is only valid after a zero adjustment.
Diode test via U/R/D/I measurement cable	Measuring current — 1 mA Measuring voltage — max. 5 V The direction of the flow is indicated by a diode symbol. The polarity of the measuring current is automatically reversed during the measurement.

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100 A and 1800 A current pick-up

DC current via 100 A current pick-up	*Range*	*Resolution*	*Tolerances*
	-5 to +5 A	1 mA	±2% of m. ±10 mA[1)]
	-50 to +50 A	10 mA	±2% of m. ±20 mA[1)]
	-100 to +100 A	100 mA	±2% of m. ±200 mA[1)]
	[1)] The accuracy of the current pick-up is only valid after calibration when there has been no change in the position or the temperature.		
AC current via 100 A current pick-up (RMS, 30 to 500 Hz, crest factor max. 3)	*Range*	*Resolution*	*Tolerances*
	0 to 5 A	1 mA	±3% of m. ±15 mA[1)]
	0 to 50 A	10 mA	±3% of m. ±25 mA[1)]
	0 to 100 A	100 mA	±3% of m. ±200 mA[1)]
	[1)] The accuracy of the current pick-up is only valid after calibration when there has been no change in the position or the temperature.		
DC current via 1800 A current pick-up	*Range*	*Resolution*	*Tolerances*
	-900 to +900 A	0.1 A	±3.5% of m. ±1.5 A[1)]
	-1800 to +1800 A	1 A	±5.5% of m. ±2 A[1)] ±3.5% of m. ±2 A[1)] for currents up to 1500 A
	[1)] The accuracy of the current pick-up is only valid after calibration.		
AC current via 1800 A current pick-up (RMS, 30 Hz to 500 Hz, Crest factor max. 3)	*Range*	*Resolution*	*Tolerances*
	0 to 900 A	0.1 A	±5.5% of m. ±2.5 A[1)]
	0 to 1800 A	1 A	±5.5% of m. ±3 A[1)] ±3.5% of m. ±3 A[1)] for currents up to 1500 A
	[1)] The accuracy of the current pick-up is only valid after calibration.		

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DSO measurement cable

Caution! ***when using the DSO cables.***

DSO cables (with blue identification of the pin plug) are approved for voltage peaks up to 400 V and not designed for use in the measurement categories II, III and IV.

For this reason, use the DSO cables only for measurements on the vehicle. Keep possible overvoltages in mind when measuring.

Measurements on the mains voltage are not permitted!

DC current at DSO (Ri ≥ 4 MΩ)	*Range*	*Resolution*	*Tolerances*
	-1.6 to 1.6 V	0.001 V	±1% of m. ±4 mV
	-4 to 4 V	0.001 V	±1% of m. ±8 mV
	-16 to 16 V	0.01 V	±1% of m. ±20 mV
	-40 to 40 V	0.01 V	±1% of m. ±40 mV
	-160 to 160 V	0.1 V	±1% of m. ±200 mV
	-400 to 400 V	0.1 V	±1% of m. ±400 mV
AC current at DSO (RMS, 30 Hz to 5 kHz, Crest factor max. 2, Ri ≥ 4 MΩ)	*Range*	*Resolution*	*Tolerances*
	0 to 1.6 V	0.001 V	±3.5% of m. ±6 mV
	0 to 4 V	0.001 V	±3.5% of m. ±11 mV
	0 to 16 V	0.01 V	±3.5% of m. ±55 mV
	0 to 40 V	0.01 V	±3.5% of m. ±80 mV
	0 to 160 V	0.1 V	±3.5% of m. ±275 mV
	0 to 400 V	0.1 V	±3.5% of m. ±550 mV
AC current at DSO (RMS, 5 kHz to 10 kHz, Crest factor max. 2, Ri ≥ 4 MΩ)	*Range*	*Resolution*	*Tolerances*
	0 to 1.6 V	0.001 V	±4.5% of m. ±6 mV
	0 to 4 V	0.001 V	±4.5% of m. ±11 mV
	0 to 16 V	0.01 V	±4.5% of m. ±55 mV
	0 to 40 V	0.01 V	±4.5% of m. ±80 mV
	0 to 160 V	0.1 V	±4.5% of m. ±275 mV
	0 to 400 V	0.1 V	±4.5% of m. ±550 mV

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Temperature sensor

T/D measuring input	The measuring input is designed for connection of a temperature sensor with a PT100 measuring element. Accuracy = ±0.5% of m. ±0.05% of measurement range end value (not including sensor errors) *Range* -20 to 200 °C

Pressure sensors

T/D measuring input	The measuring input is designed for connection of a pressure sensor with a 4 mA to 20 mA interface. Accuracy = ±0.55% of m. ±0.05% of measurement range end value (not including pressure sensor errors) *Ranges* -1000 to 1000 mbar -1 to 4 bar 0 to 60 bar 0 to 400 bar

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6.3.2 Digital Storage Oscilloscope (DSO)

Caution! ***when using the DSO cables.***

DSO cables (with blue identification of the pin plug) are approved for voltage peaks up to 400 V and not designed for use in the measurement categories II, III and IV.

For this reason, use the DSO cables only for measurements on the vehicle. Keep possible overvoltages in mind when measuring.

Measurements on the mains voltage are not permitted!

Attachable measurement cables	DSO1/DSO2 measurement cable kV pick-up Trigger clamp Current pick-up Pressure or temperature sensor	
Measurement inputs DSO1, DSO2	Make sure that both measurement connections are always adapted for each cable.	
	Band width	100 kHz (±3 dB)
	Resolution	10 Bit
	Accuracy of DC up to 10 kHz	±1%; 100 kHz -3 dB
Measurement range selection	Set manually or automatically in the auto-setup	
Measurement ranges DSO1, DSO2	Differential inputs	voltage divider ≥ 4 MΩ, 25 pF Against ground conductor potential
	Range	*Y-deflection*
	±0.4 V	50 mV/DIV
	±1.6 V	200 mV/DIV
	±4 V	500 mV/DIV
	±16 V	2 mV/DIV
	±40 V	5 mV/DIV
	±160 V	20 mV/DIV
	±400 V	50 mV/DIV

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Measurement channels CH1, CH2	Sampling rate	max. 40 MHz in 1-channel operation
	Input band-width (-3 dB)	10 MHz (without sensor)
	Sampling memory	depth 64 k (measurement values)/ Channel
	Connection	AC, DC, GND
	Measurement channels	2
	Measurement inputs	DSO1, DSO2, kV pick-up Current pick-up Pressure and temperaure sensor

Time base	*Sampling rate*
1.25 µs/DIV	40 MHz[3)]
2.5 µs/DIV	20 MHz
5 µs/DIV	10 MHz
10 µs/DIV	5 MHz
20 µs/DIV	2.5 MHz
50 µs/DIV	1 MHz
100 µs/DIV	500 MHz
200 µs/DIV	250 MHz
500 µs/DIV	100 MHz
1 µs/DIV	50 MHz
2 µs/DIV	25 MHz
5 µs/DIV	10 MHz
10 µs/DIV	5 MHz
20 µs/DIV	2.5 MHz
50 µs/DIV	1 MHz
100 µs/DIV	500 MHz
200 µs/DIV	250 MHz
500 µs/DIV	100 MHz
1 s/DIV	50 Hz
2 s/DIV	25 Hz
5 s/DIV	10 Hz
10 s/DIV	5 Hz
20 s/DIV	2.5 Hz[4)]
50 s/DIV	1 Hz[4)]
100 s/DIV	0.5 Hz[4)]

[3)] in 1-channel operation
[4)] only in draw mode

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Measurement range KV	*Range*	*Y-deflection*	*Tolerance*
	±8 kV	1 kV/DIV	±15% of m. ±200 V
	±20 kV	2.5 kV/DIV	±15% of m. ±400 V
	±40 kV	5 kV/DIV	±15% of m. ±800 V
	The size of the measurement error depends on the insulation of the ignition cable and is valid for the usage in vehicle systems with mechanical distributors. The kV input and the kV pick-up (ignition voltage adapter) together form a capacitive voltage divider. An adjustment of the tester to the ignition system with static high-voltage distribution can be made by an external wiring of the respective ignition adapter.		
Input of trigger clamp	To determine the time of the ignition at high-voltage cables (secondary side of the ignition coil)		
Trigger functions	Trigger channel	DSO1, DSO2, Current pick-up, Trigger clamp or kV pick-up	
	Trigger connection	AC, DC, HF, LF	
	Trigger edge	positive, negative	
	Trigger level	automatic or adjustable in 1% steps from the measurement range	
	Trigger delay	pre-trigger and post-trigger, adjustable in 10% steps from the deflection	
	Trigger mode	single, normal, Auto, Auto-Level, Auto set-up, Draw mode	

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6.4 Diagnostic cables

Diagnostic cable Diagnostic cable, optional Diagnostic adapter Diagnostic cable LT2, optional	5 m 3 m 0.3 m (for testing old vehicles) 3 m
Bending diameter of the cables	10 x cable diameter
Insertion cycles	> 1000

6.5 Mains cable on Workshop Trolley

Mains cable	The mains cable (6 m) can be replaced with a mains cable of the type applicable in the country of use. The mains cable must fulfill the standard for operation at grounded mains supply systems and must not be more than 6 m in length. (VDE 0805, EN 60950, IEC 950, UL 1950, CSA 22.2 No. 950) For operation in the USA and Canada, use an oil-resistant UL-approved resp. a CSA-approved mains cable.

7 Terms

Table 7-1 Terms and explanations

Term	Explanation
Acoustic signal	A beeping or whistling tone created by the tester when, for example, the voltage of the battery reaches a limit value in buffer mode.
Adaptation	This service permits interactive modification of parameters of the control system addressed and can save these new values (such as correction values for idling speed) in the control units, even permanently. The user has the possibility of changing the value and transferring it to the control unit RAM for checking. The control unit now applies the new value to its outputs and the user can check the reaction of the system. If the right correction value has been found, the tester has the control unit transfer the value and the workshop code to the writeable EEPROM. In contrast to the ↗basic setting, the control loop in question is in a closed state. With adaptation, system-specific parameters are determined and saved in the vehicle system.
Adaption values	Setting values stored in the ↗control unit which can be adapted to the vehicle within a fixed range.
Administration	An ↗operating mode of the VAS 505x. It is used for management of the tester.
Alphanumeric keyboard	Keyboard which can be used to enter numbers and text. ↗Numerical keyboard, ↗Hexadecimal keyboard.
Ambient conditions	In addition to supplying the fault memory entries, newer control units also deliver so-called ambient conditions, containing further ambient parameters relating to the error. The ↗time stamp may also be contained here.
Amplitude	The *maximum* displacement possible for the oscillation of, for example, an alternating current or alternating voltage.
Application operating modes	These include: ↗Vehicle Self-Diagnosis, OBD, ↗Guided Fault Finding and ↗Guided Functions.
Applications	An operating mode of the VAS 505x. In this operating mode you can start applications which are loaded onto the tester, e.g. Service training.

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Table 7-1 Terms and explanations

Term	Explanation
ASAM-ODX	**A**ssociation for **S**tandardisation of **A**utomation and **M**easuring **S**ystems - **O**pen **D**iagnostic data e**X**change. ASAM ODX electronic control units are built in LT3 commercial vehicles in accordance with this standard. The diagnostic procedure and the diagnosis data can differ from those of the electronic control units in the ↗protocols KWP1281/2000/6000, e.g. with the fault memory contents. ASAM ODX electronic control units work in accordance with the ↗UDS protocol.
Base CD	Installation CD. It contains the operating system, ↗Vehicle Self-Diagnosis, and the programs of the various ↗operating modes. The CD can also take the form of an update CD. In this case it only contains software components which have been changed. ↗Brand CD.
Basic features	The vehicle is identified by the basic features model, year of make, variant and engine code. Its fittings, on the other hand, are determined in the vehicle system test.
Basic setting	↗Control units are adapted to the peripheral devices with the basic setting.
Bluetooth	Wireless communication link for the more immediate vicinity.
Brand CD	Installation CD containing vehicle-specific data (↗Guided Fault Finding). ↗Base CD.
Buffered	The power supply of the tester is buffered, i.e. a built-in battery takes over the power supply for a limited time in the event of a mains failure or when the working position is changed without the mains cable being connected.
Calibration (Test Instruments)	Correction of a measurement deviation in a testing device (e.g.: current pick-up).
Calibration Touch screen	Sets the ↗touch screen so that the actual position of the points touched corresponds to the coordinate values transmitted to the PC.
CD-ROM	**C**ompact **D**isk - **R**ead **O**nly **M**emory: Data carrier for mass data. A CD can also be read by a ↗DVD drive.
Channel number	Number of a measured value channel in the ↗control unit.
Client	A program on your PC which provides the connection to a ↗server. A network client for example is the program which makes the connection to a server in the network so that you can operate your PC as a workstation in the network.

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Table 7-1 Terms and explanations

Term	Explanation
COM	Short for "common", corresponds to "earth" or "0 V"; testing devices input.
Control unit	Electronic device for controlling and monitoring vehicle functions, e.g. motor control unit. ↗Vehicle system.
Data block	↗Display group.
Degree of suspicion	The order in which ↗diagnostic objects are suspected of having faults.
Deselection, deselect	Cancelling of a selection of program functions or list entries. ↗Selection.
DHCP	Short for "**D**ynamic **H**ost **C**onfiguration **P**rotocol". DHCP is a server service which ensures that network clients are automatically allocated an IP address and further IP settings.
Diagnosis	The entire process of attributing ↗fault characteristics to possibly faulty functions, component groups or components and localising a faulty component. In VAS 505x, diagnosis is based on the ↗fault memory entries read from a ↗vehicle system, on selected customer complaints, direct function and component selection, or combined procedures.
Diagnosis object	Collective term for functions, component groups and components on which the diagnosis function is carried out.
Diagnosis socket	Connection socket for the ↗diagnostic cable on the tester or on the vehicle.
Diagnostic cable	Connecting cable between the vehicle and the tester.
Diagnostic strategy	Course taken by Guided Fault Finding on the basis of the information available about a fault, such as: 1. Fault codes read from vehicle systems 2. Complaint messages (terms describing symptoms or fault patterns selected by the user from terms shown in masks) or 3. functions and components of the vehicle selected by the user in masks as possible sources of the fault, ↗user test plan. The three entries, either individually or combined, lead to a calculated test proposal in the test plan. The strategies (1.) and (2.) are designated as system-guided fault finding, while (3.) is designated as user-guided fault finding.
Diagnostic radio head	This device permits wireless diagnostic operation between vehicle and VAS 5053 via a ↗bluetooth or WLAN interface.

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Table 7-1 Terms and explanations

Term	Explanation
Dialog box	Information field on the screen, displays messages and expects user inputs.
Display group	A fixed group of measured values which can be read out of a vehicle system.
DNS	In this case the name of the workshop domain (domain name server).
Document	Documents in the tester containing information (images, text) that can be used as needed by the user.
DSO	**D**igital **S**torage **O**scilloscope
DTC	**D**iagnostic **T**rouble **C**ode. Fault memory entry consisting of fault location, fault type and eventually ambient conditions.
DVD	**D**igital **V**ersatile **D**isk: a data carrier externally similar to the ↗CD but with a larger storage capacity.
ECU	**E**lectronic **C**ontrol **U**nit.
ECU identification data	A printable log file which is created during vehicle identification. It contains control unit identification data such as control unit designation, software part numbers, and so on.
ELSA, Elsa Win	ELSA is a workshop information system which runs under MS Windows. It includes information about service, drive, chassis and bodywork, meaning of fault memory entries, repair instructions, and circuit diagrams. ELSA runs as an application on the tester. Following first-time installation, which must be carried out by the user, the "Elsa Win" run-time system is installed and an additional button, "Elsa Win" appears in the start mask. After this, the user has to install the actual ELSA data.
End module	An end module can consist of one or more ↗function tests which are started automatically when quitting ↗Guided Fault Finding. This is used to provide feedback to the vehicle manufacturer, for example.
Energy-saving mode (stand-by mode)	Advanced Power Management (APM): a function for saving energy. If the tester is not used for a certain time the screen switches off. Once the screen is touched (do so at the top left-hand edge to avoid making unwanted inputs) the tester returns to its normal operating state.
erWin	erWin is the **E**lectronic **R**epairs and **W**orkshop **In**formation of the Volkswagen company for independent workshops.

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Table 7-1 Terms and explanations

Term	Explanation
Ethernet	The most common form of network. Here the connected computers exchange signals via a cable or another medium. Each one checks to see if the other is currently transmitting, and sends his own signals if not.
Experience rules	If workshop experiences (field experiences) with the diagnostic system are communicated to the diagnostic author, it can convert them into so-called E. and bring them into the diagnostic system. Often these are complex fault symptoms consisting of a unique combination of fault memory entries and any additions communicated by the customer. If the described experience situation occurs in the workshop, the tester can now recognize it automatically and put the relevant suspicious diagnostic objects into the test plan.
Fault characteristics	The entire effects (↗fault symptoms) of a fault scenario in vehicle functions, component groups or components.
Fault memory	Data memory of the ↗control unit in which all detected faults are stored non-volatile.
Fault symptom	A describable effect of a fault scenario in the vehicle functions, component groups or components. The symptoms make up the ↗fault characteristics. Known symptoms assigned to suspect ↗diagnostic objects are stored in the database of the tester. ↗Diagnosis.
Flash CD	Data carrier for flash data. On vehicle systems which are flash compatible, its firmware can be updated using a flash CD and VAS 505x. This procedure runs automatically in the Vehicle Self-Diagnosis when the vehicle system is selected. If the VAS 505x finds an older version of the firmware in the vehicle system compared to the version on the inserted flash CD (cannot be installed) or the flash data saved on the VAS 505x, the "Update programming" function will become available. The flash procedure is then carried out through several masks. There are also flash CDs which can be installed. In this case, you can save the flash data on the hard drive of the VAS 505x, using the Administration function "Update Installation"; then, the data will be available at any time for comparing firmware versions by calling up Vehicle Self-Diagnosis.
Flash data	The flash data consists of loadable program components for a ↗vehicle system. The tester offers various ways of comparing the version of the flash data in the vehicle system and loading more recent data onto it.

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Table 7-1 Terms and explanations

Term	Explanation
Floating	No connection to the power supply or to the grounding.
Function	Every activity which the tester can perform in its different ↗operating modes. Individual functions are usually selected from a list displayed on the screen.
Function test	A test program with which functions, component groups or components can be checked as to whether they meet requirements. The function test also can be used for a repair check.
Gateway installation list	The vehicle systems installed in the vehicle are known to a gateway control unit. It monitors the vehicle systems and draws up a status list. By interrogating the gateway installation list it is possible to find out for a vehicle system whether its fault memory is set, whether it is registered (coded), or whether communication is possible. The installation list is evaluated as part of vehicle identification and all in all results in a more powerful identification process.
GeKo test	Way of testing the code clearance and user logon for online access (confidentiality and component protection).
Guided Fault Finding	An operating mode of the VAS 505x. Here the diagnostic procedure is embedded in an optimised run sequence consisting of vehicle identification, vehicle system test, ↗test plan and ↗function tests.
Guided Functions	An ↗operating mode of the VAS 505x. This makes possible fast access to the customer service functions for the vehicle identified, e.g. "Adapt valve throttle control unit".
Hardware	Hardware primarily refers to the device itself with its mechanical structure, display and control elements, and also the basic operation.
Hexadecimal keyboard	Keyboard with which only numbers and letters A to F can be input. ↗Alphanumeric keyboard, ↗Numerical keyboard.
Information windows (left and right)	The information windows are located in a mask above the ↗work window. The left-hand information window generally contains the following information: ↗operating mode, active function, task. The right-hand information window shows the currently selected components or status messages (operating mode ↗Test Instruments) or a separate selection list of control units working in conjunction (operating mode ↗Vehicle Self-Diagnosis).

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Table 7-1 Terms and explanations

Term	Explanation
Initial graphic	Exchangeable image of a vehicle which appears in the ↗Start mask.
Inline current measurement	Current measurement in which the tester is used as an ammeter directly in the circuit. Opposite: Inductive current measurement via a current pick-up clamped on the cable.
IP address	Short for "**I**nternet **P**rotocol **A**ddress". Every computer which is connected to a computer network (TCP/IP) has a unique IP address. It consists of four groups of numbers which are separated by points (e.g. 194.0.0.135). IP addresses can be allocated automatically by ↗DHCP servers.
IrDA	**I**nfra**r**ed **D**ata **A**ssociation. The IrDA interface can create a wireless, infrared contact between the tester and a printer.
ISDN	Short for "**I**ntegrated **S**ervices **D**igital **N**etwork". Designation for a digital telephone network which is conceived for telephone calls, remote data transmission, faxes and other services.
Job code	A unique combination of symbols and letters used to identify interrupted and saved diagnosis jobs.
Key CD	CD which holds the key code to the expanded functions. It needs to be inserted in the CD/DVD drive for expanded functions to become accessible.
LAN	**L**ocal **A**rea **N**etwork.
Mask	Screen display with fixed division into various graphic elements such as windows, buttons, scroll bars etc.
Measurement type	In ↗Test Instrument mode, the measurement type defines whether the measurement is executed with DC voltage or AC voltage. In ↗Guided Fault Finding mode the measurement type determines whether a current or a voltage is measured in a ↗function test.
Mirror server	A software package that can be saved locally, for example on the dealership server, to provide data such as the update program for the VAS 505x when required. The dealership server is connected to the central office and receives the current updates from there. Within a workshop, each tester connected to an ↗LAN fetches the current programs automatically when it is switched on, or when the Administration function "Net-update" is carried out.
Mode, Modes	The current operating state of the tester, or its program.

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Table 7-1 Terms and explanations

Term	Explanation
Navigation bar	Functions in the bottom part of the ↗mask to change from the current mask to other masks and to offer help, save and print functions.
Non-VW vehicle	Any vehicle type which is not part of the Volkswagen company.
Numerical keyboard	Keyboard which can be used to enter numbers but not letters. ↗Alphanumeric keyboard, ↗Hexadecimal keyboard.
OBD vehicle systems	Vehicle systems of the "**O**n-**B**oard **D**iagnosis" system, which is integrated into the engine management system and constantly monitors the components related to the exhaust.
Old vehicles	Older vehicle models for which no diagnostic data is available (also termed "non-included vehicles"). Only the vehicle identification with vehicle system test and sometimes a few customer-specific instructions are available for old vehicles which appear in the ↗masks for entering ↗basic features.
Online connection	External connection, e.g. to the Internet or to the VW server.
Online feedback log	A log which is sent online to the vehicle manufacturer.
Operating mode	All the basic functions of the tester which can be called from the ↗Start screen: ↗Vehicle Self-Diagnosis, ↗OBD, ↗Test Instruments, ↗Guided Fault Finding, ↗Guided Functions, ↗Administration and ↗Applications. Every operating mode is subdivided into a number of individual ↗functions. ↗Application operating modes
Oscilloscope	Measurement and display device for electrical signals that displays the time characteristic of the signal strength (e.g. oscillations).
Partner application	The partner application makes administrative functions available to the VAS 5053 (such as ↗update, screen calibration, and so on). The partner application is installed either on a workshop PC or on a VAS 5051B / VAS 5052.
PCMCIA cards	(**P**ersonal **C**omputer **M**emory **C**ard **I**nternational **A**ssociation) cards of credit card size used above all for installation in laptops or notebooks. PCMCIA is the standardised interface with which these devices must comply. There are for example, network cards, ↗ISDN cards or modems as PCMCIA cards. In the latest version, the standard is called PC-Card-Standard.
Permanent error	↗Unlearning counter.

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Table 7-1 Terms and explanations

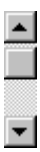
Term	Explanation
Preselection	The suggestion of the tester to call up one of several functions from the current ↗mask. The preselection is shown by a black bar on the screen. You can change it at any time.
Protocols KW1281, KW2000, KW6000 ↗UDS	Keyword protocols specify the precise procedure to be used for the exchange of data between the control unit and the tester. Older control units use the KW1281 protocol to communicate while newer control units use KW2000 or KW6000 (CAN diagnosis); ASAM electronic control unit use ↗UDS. In Vehicle Self-Diagnosis the tester automatically ascertains the keyword protocol variants for a control unit before selection of the diagnostic functions.
Proxy server	Proxy servers receive the requests made by a client and forward their data (sometimes modified) to the original target. Proxies can also save data locally on a temporary basis, for future accessing (cache).
Quit	The reply to a question of the tester whereupon a function or a dialog is ended.
Readiness code	8-position binary code which indicates whether all diagnostics relevant to exhaust gas have been run through by engine management.
Removable storage device	Depending on the tester type, data is saved to diskette and/or ↗USB memory stick. If both storage media are connected, output to the USB memory stick will be preferred. With the VAS 5051 output to USB memory stick is not possible but you can use all USB memory sticks recommended by VW with other testers.
Reverse polarity	Switching of the connecting leads for the power supply.
Run-time system	The software installed in the tester.
Screen shot (hardcopy)	Hard copy of the screen contents (↗masks etc.).
Scroll bar	 If the complete text cannot be shown in a ↗dialog box or a ↗mask, a scroll bar will appear on the right-hand side.
Selection	Selection of a program function or a text entry from a list. The selected element is identified by a black bar on the screen. ↗Deselection.
Selection bar	Emphasises a selected line by inverting the colours.

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Table 7-1 Terms and explanations

Term	Explanation
Self-diagnosis	↗Vehicle systems can also carry out self-diagnosis. They have methods of constantly checking their own functions, connected ↗sensors and actuators. A fault results in an entry being made in the ↗fault memory of the vehicle system. The tester knows all the faults saved in its knowledge base, so that on reading the fault memory it is able to attribute the fault code to a fault type and a fault location and thus to make a test suggestion.
Sensor	Device which records measured values.
Server	In computer technology the server describes a central network computer. This provides the ↗clients with the appropriate services and data.
Shutdown delay	The time between activating the On/Off switch to switch off the tester and when it actually switches itself off. The delay is about 10 seconds.
Sporadic error	↗Unlearning counter.
Start mask	The display which the tester shows on the screen after starting operation. Its operating modes can be called from here. Recognisable from the ↗initial graphic.
Start module	A start module can consist of one or more than one ↗function tests which are started automatically after the vehicle system test. They are use to check e.g. whether there is new flash data for a vehicle system.
Startup	Activity of the tester between switching on and first display of the ↗Start mask, includes loading of data, a self-test, etc. During this time no entries are possible.
Station name	A tester connected to the ↗LAN requires a unique name for the network. As standard, the tester is given the name e.g. VAS5051. You can display the station name currently set by selecting the function "Display network settings" in ↗Administration, Network settings. If there are several testers of the same type in the network, their names must be different.
Subnet mask	All computers connected to a network (TCP/IP) have a subnet mask. It consists of four groups of numbers which are separated by full stops (for example, 255.255.0.0).

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Table 7-1 Terms and explanations

Term	Explanation
Test Instruments	An ↗operating mode of the VAS 5051 / VAS 5051B. You can use the Test Instruments to carry out measurements yourself, the results of which are then displayed on the tester numerically or graphically. A multimeter and an ↗oscilloscope (DSO) are available.
Test plan	In Guided Fault Finding and Guided Functions the ↗diagnostic objects are added to the test plan during the diagnosis session and managed. Particularly in the case of multiple suspicious diagnostic objects the test plan allows the user to keep an overview of things. Each diagnostic object is preceded by a status symbol. The diagnostic objects are added to the test plan via read-out fault memory entries, selected observations, or the function and component selection. In addition, new diagnostic objects can be added to the test plan even from a function test or existing ones set to OK.
Test step	A single, complete stage in a ↗function test.
Time record	The time taken for the diagnosis session is calculated. This occurs in part by recording times which have actually elapsed, and through standard times for particular actions. In the individual phases of the ↗Guided Fault Finding, the time is calculated, added up and written into the diagnosis log in temporal units.
Time stamp	Control units of the new generation will provide ↗ambient conditions as well as fault memory entries. These include the time stamp. It contains the date and time at which the corresponding fault occurred.
Touch screen	A screen which has a touch-sensitive surface. The corresponding hardware and software reacts to it being touched with a touch pen or finger, detects the place touched and launches the ↗function linked with this location (a button, for example). The touch screen replaces externally connected input devices such as keyboard, mouse, and so on.
Trigger level	Voltage value at which the measurement of a test signal characteristic is started.
Trigger signal	The signal used to start the graphing process of a test signal characteristic.
UDS	**U**nified **D**iagnostic **S**ervices; a unified ↗protocol for electronic control unit Communication setup, building on KW2000 for ↗ASAM ODX electronic control units.

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Table 7-1 Terms and explanations

Term	Explanation
Unlearning counter	Should an error occur during a driving cycle (terminal 15 on until terminal 15 off) it is first entered as "static" in the fault memory. If it is not detected during the next driving cycle, the designation is changed to "sporadic" and an unlearning counter with an output value of, for example, 40 is decremented by 1. This is repeated during each driving cycle free of the fault, until the unlearning counter reaches 0 and the fault is thus automatically cleared. However, if the registered fault should reoccur during a later driving cycle, then the unlearning cycle is set to its output value and the error provisionally set back to "static" again.
Update	Software modification package for updating an existing program to a later version. 1. New version of the ↗run-time system which is downloaded from ↗CD. 2. New program version of a ↗vehicle system which is imported by the tester.
URL	Abbreviation of "**U**niform **R**esource **L**ocator". A URL corresponds to the address of an internet resource (web site, file, etc.). Example: www.siemens.com
USB	**U**niversal **S**erial **B**us. USB is a standardized interface for connecting, for example, keyboard, ↗USB memory.
USB storage device	Also known as USB memory stick. A mobile, easy to handle memory unit with a USB interface. It is plugged into the USB port on the tester and is detected automatically by the tester. Assignment takes place with the function "Set output medium on removable storage device" (navigation bar, print). Now you can send, for example, logs or screen shots to the USB memory.
User test plan	↗Diagnostic strategy based on the selection of descriptions of possible defective functions and components by the user. If faults in the vehicle system are detected during diagnosis or a complaint report is entered, the test plan differentiates between the system test plan and a user test plan.

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Table 7-1 Terms and explanations

Term	Explanation
Variant, variant rule	This term is used with reference to the ↗vehicle system fittings. Some fittings, for example an airbag, may be available in various variants for an identified vehicle. The most important task of the vehicle system test is to find out which variant is actually installed. If the variants cannot be determined automatically, Yes/No questions on the fitting will follow, e.g. "Automatic gearbox?". The mechanisms used to determine the variants are known as variant rules. Their results determine which diagnosis data should be made available, amongst other things.
Vehicle identification	Vehicle identification is defined by the vehicle's ↗basic feature components (type, model year, body version, engine code) that can be determined automatically or partly automatically in an existing gateway. These data are used to check a list of all possibly installed electronic control units/devices and their installation in the ↗vehicle system test.
Vehicle Self-Diagnosis	VAS 505x operating mode in which you can communicate with the ↗vehicle systems available in the vehicle and carry out a thorough ↗diagnosis, via dialog boxes.
Vehicle system	A ↗control unit of a known name, e.g. motor control unit, including the appropriate ↗sensors, actuators and wiring.
Vehicle system test	A list of all possibly installed vehicle systems (electronic control units, devices) is generated from the ↗vehicle identification. In the vehicle system test, all systems are examined for availability and their error status is queried. If necessary, inquiries about equipment appear here also.
Virtual keyboard	The graphic representation of a keyboard on a ↗screen. The individual buttons can be operated by touching them with a touch pen in the same way as those of a real keyboard.
Work window	The work window takes up the largest part of the ↗mask. The display changes according to the ↗operating mode and current progress. Here you can make a selection, or view results (e.g. from ↗Test Instruments).

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We have checked the contents of the documentation to ensure they correspond to the status described. Nevertheless deviations cannot be entirely excluded and we cannot therefore guarantee complete agreement. The information in this documentation is however regularly reviewed and any corrections necessary will be incorporated in the next edition. We will be grateful to receive suggestions for improvement.

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VOLKSWAGEN AG
KD-Werkstattausrüstung
D-38436 Wolfsburg

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Automation & Drives
Industrial Automation Systems
A&D AS AP TE SF AS
Siemensallee 84
D-76187 Karlsruhe

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